

Sessions

Friday, October 31, 2003

A FIRST-YEAR SEMINAR COURSE FOR MATHEMATICS MAJORS

John Polhill, Jr., *Bloomsburg University*

FRI - S2
INTERNATIONAL B
10:00 AM - 10:45 AM

In this session, we will discuss a course for first-year students majoring in mathematics and secondary education/mathematics. The goals of this course include encouraging students to excel in mathematics, introducing students to the mathematics behind various careers, and improving retention of majors.

USE OF MATHEMATICA® IN TODAY'S CALCULUS CLASS

Bradley Stoll, *The Harker School*

FRI - S3
INTERNATIONAL C
10:00 AM - 10:45 AM

We will present some Mathematica® notebooks that illustrate how to use Mathematica® in the calculus classroom. Participants will learn how to create their own notebooks. Topics include: approximating zeros, slope-fields, and non-routine functions.

SEX, DRUGS AND ROCK N' ROLL

Jay Lehmann, *College of San Mateo*

FRI - S4
INTERNATIONAL D
10:00 AM - 10:45 AM

Intermediate Algebra students have "seen it all before." Yet they are overwhelmed by "tons of unrelated rules." Curve fitting rock concerts, Starbucks, terrorism, guitars, sex in the military, wind power, and Kahlúa livens up the course while threading concepts into an authentic necklace with 75% success rates in subsequent courses.

JAVA TOOLS FOR ALGEBRA AND TRIGONOMETRY

Robert Mayes, *West Virginia University*

FRI - S5
INTERNATIONAL E
10:00 AM - 10:45 AM

The Institute for Math Learning has developed a number of JAVA based web tools for teaching algebra and trigonometry. A number of these tools and associated labs will be demonstrated.

GEOMETRY AND MATRIX IN GROUPS IN LINEAR ALGEBRA

Timothy Comar, *Benedictine University*

FRI - S6
INTERNATIONAL F
10:00 AM - 10:45 AM

We present several activities using the software Derive™ to integrate geometric and group theoretic notions into a linear algebra course via matrix actions on vector spaces and matrix multiplication. These activities provide additional geometric content to the mathematics major and ease the transition to more abstract courses in algebra.

THE TRAVELING SALESMAN PROBLEM, MAPLE® SIMULATIONS OF ALGORITHMS, COOPERATIVE LEARNING AND MULTI-DISCIPLINARY TEACHING

Bruno Guerrieri, *Florida A& M University*

FRI - S7
AMBASSADOR
10:00 AM - 10:45 AM

Introduction to the different methods of solution (nearest-neighbor, elastic net, branch and bound, simulated annealing, Lin-Kernighan, genetic algorithms, swarm intelligence, and neural network) of the Traveling Salesman Problem. We will provide the common Maple® library needed and the supporting notes/worksheets so as to deliver a "turn-key" product.

TEACHING/LEARNING e-ACTIVITIES THROUGH THE TI-83 PLUS SE AND THE STUDYCARD™ APP

Ed Laughbaum, *The Ohio State University*

FRI - S8
CONSULAR
10:00 AM - 10:45 AM

Learn how to create StudyCard™ stacks (e-Activities) that are guided-discovery in nature, make them summative assessments or create them to use as your daily teaching lesson plan! Link them to student devices to be used outside of the class to prepare students for your topical lesson and more...

Sessions

COMPUTER ALGEBRA IN THE CLASSROOM: PROMISES, PERILS, AND PEDAGOGIC PERSPECTIVES

Edmund Lamagna, *University of Rhode Island*
William Bauldry, *Appalachian State University*
J.Douglas Child, *Rollins College*
Wade Ellis, *West Valley College*

FRI - S9
INTERNATIONAL A
10:00 AM - 11:45 AM

Computer Algebra Systems (CAS) have revolutionized how mathematics is done and taught. Their evolution is traced, emphasizing applications to collegiate mathematics. Successes and benefits of CAS in the classroom, along with potential pitfalls, and perils are assessed. Several design and implementation issues are discussed to illustrate the inherent and practical limits of CAS and to demystify their operation.

CREATING WebCT QUESTIONS FOR QUIZZES AND TESTS IN COLLEGE ALGEBRA

Laura Pyzdrowski, *West Virginia University*
Anthony Pyzdrowski, *California University of Pennsylvania*

FRI - S10
INTERNATIONAL B
11:00 AM - 11:45 AM

This presentation will review methods of generating WebCT questions for use in quizzes and tests in a web-enhanced algebra course. Methods will include: scripting questions in a word processor, importing questions from test generating packages, and using the management tool *Respondus*. Issues regarding implementation will also be discussed.

ANIMATIONS FOR CALCULUS

Jose Flores, *University of South Dakota*

FRI - S11
INTERNATIONAL C
11:00 AM - 11:45 AM

We have created a package with animations using Mathematica®, LiveGraphics3D™, and Flash ActionScript™. The set of animations are intended to improve instruction of calculus by incorporating the dynamics of mathematical concepts into the classroom presentations.

USING AN ONLINE TEXT TO TEACH DEVELOPMENTAL ALGEBRA

Sherri Urcavich, *University of Wisconsin - Green Bay*

FRI - S12
INTERNATIONAL D
11:00 AM - 11:45 AM

In our third year of offering the summer algebra course online, students were given the choice of taking the class online, in person, or a combination of both. We have also designed a supplemental web page with audio walk-throughs of the more challenging problems.

COME TEST DRIVE THE SHARP EL9900 GRAPHING CALCULATOR

Charles Ames, *Tulsa Community College*

FRI - S13
INTERNATIONAL E
11:00 AM - 11:45 AM

A graphing calculator with the functionality of both a TI-73 and TI-83 and costs less than \$55! Come and compare.

USING BOTH A TI-89 AND MAPLE® IN A LINEAR ALGEBRA/DIFFERENTIAL EQUATION COURSE

Dennis Pence, *Western Michigan University*

FRI - S14
INTERNATIONAL F
11:00 AM - 11:45 AM

We will compare what the TI-89 graphing calculator and what the CAS Maple® offer in a course where both linear and differential equations must be taught. Given the time constraints of the combined course, we depend upon these tools to make many topics possible and accessible.

INTRODUCING MAPLE® INTO THE DISCRETE MATHEMATICS COURSE

Katherine McGivney, Doug Ensley, *Shippensburg University*

FRI - S15
AMBASSADOR
11:00 AM - 11:45 AM

Participants will learn to how to use Maple® to design exploratory activities for students in discrete mathematics. The specific topics will include sequences, sets, relations, combinations and probability. Participants should have some familiarity with Maple®.

Sessions

THE IMPACT OF DYNAMIC GEOMETRY SOFTWARE AS A DIDACTICAL TOOL

Antonio Quesada, *University of Akron*

FRI - S16
CONSULAR
11:00 AM - 11:45 AM

We will address three areas where dynamic geometry software (DGS) is having an impact as a didactical tool. Namely, its use as a powerful inquiry-based tool, its use to teach concepts from other areas, and finally, we will present some interesting newly found results obtained by secondary students using DGS.

WEB-BASED TEMPLATE FOR CREATING ONLINE TESTS

Diem Nguyen, *Bowling Green State University*

FRI - S17
INTERNATIONAL A
12:00 PM - 12:45 PM

Participants will learn how to put a test online, and how to create an automatic scoring and instant feedback system with a particular method of data collecting.

NONLINEAR OPTIMIZATION FOR THE CLASSROOM - STEEPEST ASCENT, NEWTON, AND CONJUGATE DIRECTIONS WITH MAPLE®

William Richardson, Jr., William Fox, *Francis Marion University*

FRI - S18
INTERNATIONAL B
12:00 PM - 12:45 PM

Need an optimization process for a nonlinear multivariable function? Implementing classic optimization algorithms like steepest ascent, Newton's Method, and the conjugate method in Maple® can strike a valuable compromise between tediously grinding out step-by-step approximations with a calculator and using a "canned" optimization package.

HOW TO MAKE AND USE MAPLE® ANIMATIONS, AND WHAT WE CAN LEARN FROM THEM

John Putz, *Alma College*

FRI - S19
INTERNATIONAL C
12:00 PM - 12:45 PM

Methods of creating effective animated demonstrations using Maple®, including some new features of Maple® 8, will be discussed. Suggestions will be offered for using them in the classroom. Occasionally, a demonstration will reveal a relationship that we might not have mentioned in class were it not so clearly shown in the animation.

ONLINE DEVELOPMENTAL MATH: IS THIS A GOOD IDEA?

Sandee House, Susan Nelson, *Georgia Perimeter College*

FRI - S20
INTERNATIONAL D
12:00 PM - 12:45 PM

The presenters will share their findings from two years of online developmental math courses. Items discussed include: software course components, testing modifications made during the two-year period, pass rates in developmental online classes as well as subsequent college-level math.

RISKY BUSINESS: CONNECTING MATHEMATICS WITH BUSINESS AND ECONOMICS

Lisa Yocco, *Georgia Southern University*

Ronald Harshbarger, *University of South Carolina – Beaufort*

FRI - S21
INTERNATIONAL E
12:00 PM - 12:45 PM

Business and Economics majors will likely have careers that require reading for comprehension, problem solving skills, and the ability to analyze and interpret. Thus we have created group projects that require students to work collaboratively to solve problems that connect mathematics concepts and skills with business and economic applications.

USING MATHEMATICA® TO VISUALIZE PARTIAL DIFFERENTIAL EQUATIONS

Timothy Miller, *Missouri Western State College*

FRI - S22
INTERNATIONAL F
12:00 PM - 12:45 PM

Mathematica® can be used to help students to visualize some of the important concepts in partial differential equations. Demonstrations of convergence of Fourier series, vibrating strings and membranes, traveling waves, one- and two-dimensional heat flow, and hanging chain will be given.

MODELING ACROSS THE DISCIPLINES: A COMPUTATIONAL SCIENCE PARADIGM

Ignatios Vakalis, *Capital University*

FRI - S23
AMBASSADOR
12:00 PM - 12:45 PM

The emerging interdisciplinary field of Computational Science integrates mathematical modeling, computing, and visualization techniques. Funded by grants from NSF (CCLI-EMD 9952806) and the W.M. Keck Foundation, Capital University is creating educational materials and a comprehensive undergraduate program in Computational Science. The program, as well as examples of modeling from various disciplines will be presented.

Sessions

MAKING MATHEMATICS MORE ATTRACTIVE USING NEW TECHNOLOGY FOR EXPERIMENTS IN CROSS-CURRICULUM PROJECTS

Klaus Aspetsberger, *State College of Teacher Education*
Briggita Aspetsberger, *Bundesrealgymnasium*

FRI - S24
CONSULAR
12:00 PM - 12:45 PM

Experiments carried out by pupils using new technology are used to make mathematics and natural sciences more attractive. In this presentation, we will report about our experiences made during science classes where pupils were working at several topics integrating math to biology, chemistry and physics experiments.

MOVING BEYOND STATIC WEB PAGES - BRING YOUR ONLINE DOCUMENTS TO LIFE WITH MathML

Bob Mathews, *Design Science, Inc.*
Charles Ames, *Tulsa Community College*

FRI - S25
INTERNATIONAL A
1:00 PM - 1:45 PM

Creating a web page for posting class notes and practice problems is not a difficult chore. Adding interactivity to your web pages is extremely difficult - or is it? This session will introduce some easy tips and techniques that will enable you to build interactivity into your web pages with MathML™.

DYNAMIC SPREADSHEET APPLICATIONS IN CALCULUS, DIFFERENTIAL EQUATIONS AND BEYOND

Robert Devaney, *Boston University*

FRI - S26
INTERNATIONAL B
1:00 PM - 1:45 PM

Spreadsheets offer excellent opportunities to animate concepts from introductory mathematics courses. We give some examples which also give students a glimpse of contemporary ideas in mathematics.

A DOCKING PROBLEM FOR THE SPACE STATION

Dan Van Peurse, *The University of South Dakota*

FRI - S27
INTERNATIONAL C
1:00 PM - 1:45 PM

A calculus group project will be presented that makes use of the standard governing equations for linear motion. The project models a space ship that has a vertical booster and a horizontal booster with the main objective of docking the space ship to the space station.

USING ONLINE TUTORING SYSTEMS – SUCCESSSES, FAILURES AND LESSONS LEARNED

Beverly Michael, *University of Pittsburgh*

FRI - S28
INTERNATIONAL D
1:00 PM - 1:45 PM

This talk will focus on how online tutoring systems can be integrated into standard college algebra lecture classes of various sizes and into distance education courses.

TEACHING MATHEMATICAL PROOF WITH TECHNOLOGY TO FIRST YEAR STUDENTS

Doug Ensley, Winston Crawley, *Shippensburg University*

FRI - S29
INTERNATIONAL E
1:00 PM - 1:45 PM

With discrete mathematics being taught at the freshman level, the role of "proof" in this course is under scrutiny. The presenters will demonstrate computer-based activities from their freshman course that teach proof as an interactive process. They will also share preliminary assessment data on learning objectives for this course.

MAPLE® VERSUS VARIABLE MASS SPRING EQUATION

Joel Fowler, *Southern Polytechnic State University*

FRI - S30
INTERNATIONAL F
1:00 PM - 1:45 PM

Differential equations arising from a variable mass spring are considered with Maple®'s assistance. The solutions provide an introduction to Bessel functions and a reiteration of linear differential equation theory, as well as a nice application of technology. The problems are suitable for technology assisted classroom projects.

ONE SCHOOL'S SUCCESS IN RECRUITING MATHEMATICS AND COMPUTER SCIENCE MAJORS

Lisa Lister, John Polhill, Curt Jones, *Bloomsburg University*

FRI - S31
AMBASSADOR
1:00 PM - 1:45 PM

While the overall enrollment of students in college has been increasing nationwide, the number of mathematics majors has been decreasing. At Bloomsburg University however, we have had a steady increase in mathematics and computer science majors since 1994. In this talk we will discuss the methods we use to achieve this success and our plans for the future.

Sessions

USING PCCALCULATOR (NEW) TO ENHANCE COLLEGIATE MATHEMATICS, WITH EMPHASIS ON TRANSFORMATIONS, INTEGRATION, STATISTICS, AND PROBABILITY DISTRIBUTION

Simon Ugwuoke, *Shaw University*

FRI - S32
CONSULAR
1:00 PM - 1:45 PM

This session starts with a PowerPoint presentation of a survey on classroom use of technology. Activities with PcCalculator will then be demonstrated. We will explore various ways of enhancing collegiate mathematics using this multipurpose software with emphasis on graphical transformations, binomial expansion, integration, and probability distributions.

A SUCCESSFUL ONLINE DEVELOPMENTAL ALGEBRA COURSE

Pamela Cohen, *Southern New Hampshire University*

FRI - S33
INTERNATIONAL A
2:00 PM - 2:45 PM

The presenter teaches fundamentals of algebra as a totally asynchronous eight-week distance education course, using BlackBoard. This session will offer an overview of the course. Learn what has worked and what has not. Topics include: course lectures, assignments, testing, motivating and managing class discussions, virtual office hours and more.

MAXIMA™, LaTeX™ AND MAPLE® IN POCKET PC'S

Gabriel Lugo, Russell Herman, *University of North Carolina - Wilmington*

FRI - S34
INTERNATIONAL B
2:00 PM - 2:45 PM

We discuss the strengths and limitations of the latest versions of Maxima™ and LaTeX™ running locally on handheld devices. We then demonstrate client-server software that allows remote control of desktop packages such as Maple® and MathCAD™ on a pocket PC over a wireless network. We provide instructional examples.

ONE-WEEK PROJECTS IN A COMPUTER LAB: THE BEST OF ALL WORLDS

Richard Mercer, *Wright State University*

FRI - S35
INTERNATIONAL C
2:00 PM - 2:45 PM

The approach of spending one week on projects and the rest of the term on the syllabus will be discussed. Pedagogy, administration, and examples will be discussed.

ALGEBRA, COMPUTER ALGEBRAS, AND SYMBOLIC LITERACY

Deborah Hughes Hallett, William McCallum, *University of Arizona*

FRI - S36
INTERNATIONAL D
2:00 PM - 2:45 PM

The Rule of Four has played a major role in encouraging students to link different representations of mathematical ideas. This presentation will focus on the impact of computer algebra on students' understanding of symbolic representations.

SIMULATION AND VISUALIZATION OF THE PROCESS OF STATISTICAL INFERENCE WITH FATHOM™

Gina Foletta, *Northern Kentucky University*

William Finzer, *KCP Technologies*

FRI - S37
INTERNATIONAL E
2:00 PM - 2:45 PM

To make sense of statistical inference, students must think beyond sample data to a hypothetical process of repeated sampling. Technology enables us to make the hypothetical concrete, providing an animated visualization that can serve as a framework for student understanding. We will illustrate this pedagogy with classroom-usable activities.

NUMERICAL METHODS USING MATHEMATICA® NOTEBOOKS AND WEB APPLETS

Nora Strasser, *Friends University*

FRI - S39
AMBASSADOR
2:00 PM - 2:45 PM

A demonstration of using BlackBoard to organize Mathematica® notebooks and web applets will be included. The notebooks provide demonstrations of numerical techniques without requiring advanced programming skills. The web applets are used to facilitate understanding. Combining the two provides students with an accessible and engaging introductory numerical methods course.

ONLINE INTERACTIVE WORKSHOPS: COMMUNICATIONS SOFTWARE AND MathDL RESOURCES

Lawrence Moore, David Smith, *Duke University*

Frank Wattenberg, *United States Military Academy*

FRI - S40
CONSULAR
2:00 PM - 2:45 PM

We have conducted two MAA PREP workshops entitled *Authoring Online Interactive Materials in Mathematics*. These were both about online materials and presented online, with participant teams at dispersed sites. We discuss (a) how the workshops were run, including supporting software; (b) what the participants did and what they produced.

Sessions

THE INTERSECTION OF THE GRAPHS OF AN EXPONENTIAL FUNCTION AND ITS LOGARITHMIC INVERSE

Gary Rockswold, *Minnesota State University, Mankato*
Terry Kreiger, *Winona State University*

FRI - S41
INTERNATIONAL A
3:00 PM - 3:45 PM

What are the conditions whereby an exponential graph will intersect its corresponding logarithmic inverse? What bases (if any) make this possible? How many intersection points are possible and when do they occur? These questions will be investigated using calculus and Curvus Pro™ graphing software.

WEBSITE CONSIDERATIONS AND ACCESSIBLE DESIGN

Sarah Lou Mabrouk, *Framingham State College*

FRI - S42
INTERNATIONAL B
3:00 PM - 3:45 PM

This presentation highlights website design considerations including organization, the use of colors, fonts, themes, backgrounds, graphics, textboxes, tables, and sounds as well as accessible design. Careful design and organization can make a website accessible for both graphical and text-only browsers. Test a site using the lynx viewer at <http://www.delorie.com/web/lynxview.html>.

ITERATION THROUGHOUT MATHEMATICS: DOING IT AGAIN AND AGAIN IN CALCULUS, FRACTALS, CHAOS AND MORE

Kevin Lee, *Normandale Community College*
Scott Steketee, *KCP Technologies*

FRI - S43
INTERNATIONAL C
3:00 PM - 3:45 PM

Iteration is at the heart of much traditional mathematics, such as calculus, and is fundamental to exciting new areas like fractals and chaos. Technology makes iteration more accessible to students, allowing new ways of exploring and visualizing. We will use spreadsheets, graphing calculators and dynamic geometry software to explore mathematical iteration.

ENRICHING DEVELOPMENTAL ALGEBRA WITH GRAPHING CALCULATOR ACTIVITIES

Bob Pesut, *Pellissippi State Technical Community College*

FRI - S44
INTERNATIONAL D
3:00 PM - 3:45 PM

Graphing calculators can be used to enrich the developmental algebra curriculum beyond the ordinary functions for which they are currently used. This presentation will suggest some activities which are designed to spark student interest and enhance their understanding of algebra principles.

P5: PRECALCULUS PROJECTS WITH POWERBARS, POUNDS AND POLLUTION

Barbara Bendl, Amy Kimchuk, *University of Sciences in Philadelphia*

FRI - S45
INTERNATIONAL E
3:00 PM - 3:45 PM

The presentation begins with an overview of the technology used in the freshman pre-calculus course at the University of Sciences in Philadelphia. Two project topics, one using Derive™ and one using the TI-83+ calculator will be demonstrated.

THE "I" IN ICTCM: SOME INTERNATIONAL COMPARISONS

Anthony Watkins, *University of Plymouth, United Kingdom*
Antonio Quesada, *University of Akron*
Brenda Lee, *WeFeng Institute of Technology, Taiwan*
John Cosgrave, *St. Patrick's College, Ireland*
Harry Gretton, *Sheffield Hallam University, United Kingdom*

FRI - S46
INTERNATIONAL F
2:00 PM - 3:45 PM

This panel will be jointly chaired by Antonio Quesada (USA) and Anthony Watkins (UK). Academics from the USA, Canada, Latin America, Europe and Asia will present comparisons and contrasts in the technologies used in mathematics teaching and learning. Audience participation will be encouraged.

EXPLOITING EUCLID'S ALGORITHM FOR FUN AND PROFIT

Edmund Lamagna, *University of Rhode Island*

FRI - S47
AMBASSADOR
3:00 PM - 3:45 PM

Euclid's algorithm for greatest common divisors is perhaps the oldest nontrivial algorithm still in use. Polynomial GCD computation is at the heart of every computer algebra system. We consider how the Euclidean algorithm for polynomials can be implemented efficiently and present some surprising applications to polynomial factorization, simplification of expressions involving radicals, and rational function integration.

Sessions

FRI - S48
CONSULAR
3:00 PM - 3:45 PM

DEMO-GRAPHICS: NATIONAL TRENDS IN THE USE OF TECHNOLOGY
Don Hutchison, Mark Yannotta, *Clackamas Community College*

The presenters will discuss student demographic changes that impact both what is taught and how it is taught. They will also discuss "technology demographics", which will focus on the kind of equipment to which students have access.

FRI - S49
INTERNATIONAL A
4:00 PM - 4:45 PM

LEARNING MATHEMATICS THROUGH WEB-BASED EXPERIMENTS
Charles Pheatt, Jorge Ballester, *Emporia State University*

The use of web-based experimentation using web-accessible experiments will be demonstrated. These experiments can be used by students to reinforce mathematical concepts.

FRI - S50
INTERNATIONAL B
4:00 PM - 4:45 PM

MATLAB™ IN THE ENGINEERING CURRICULUM
Alan Davies, Stephen Kane, *University of Hertfordshire, United Kingdom*

The University of Hertfordshire is using MATLAB™ in the mathematics curriculum for engineering students. A university-funded teaching and learning initiative has allowed the development of a set of web-based workshops. In this session, these resources will be available and the presenters will show how they are embedded in their teaching.

FRI - S51
INTERNATIONAL C
4:00 PM - 4:45 PM

A MODELING EXTRAVAGANZA
Robert Kowalczyk, Adam Hausknecht, *University of Massachusetts of Dartmouth*

Realistic models are the heart and soul of any mathematics course. In most first- and second-year mathematics courses, there are a multitude of topics where real-world models can be integrated into the curriculum. We will demonstrate how to use modern-day technology to develop models that stimulate interest in the mathematics being studied.

FRI - S52
INTERNATIONAL D
4:00 PM - 4:45 PM

REACHING THE MATHEMATICS STUDENTS LEFT BEHIND THROUGH TECHNOLOGY
George Reese, Jerry Uhl, *University of Illinois at Urbana - Champaign*

Our talk will present the results of an experimental course for reaching students who have been filtered out of the mathematics pipeline and brings them back to mathematics with a stronger sense of accomplishment and knowledge of quality mathematics.

FRI - S53
INTERNATIONAL E
4:00 PM - 4:45 PM

DEVELOP INTERACTIVE ASSIGNMENTS AND LABS FOR ENTRY LEVEL MATHEMATICS COURSES
Mary Hudachek Stephens, *Clayton College and State University*

A variety of mathematics labs, web notes, and assignments will be presented illustrating modeling functions and pre-calculus concepts. Participants will learn how to utilize software, and create customized assignments for their own classroom demonstration.

FRI - S54
INTERNATIONAL F
4:00 PM - 4:45 PM

TECHNOLOGY'S POTENTIAL AS A COGNITIVE AMPLIFIER IN ABSTRACT ALGEBRA
Richard Grassl, *University of Northern Colorado*
Tabitha Mingus, *Western Michigan University*

Supportive technology in abstract algebra can enhance understanding of co-sets, quotient groups, homomorphisms, and can be indispensable for conjecturing. An assessment of the advantages of the incorporation of technology will be discussed in the context of survey and interview data collected during the semester.

FRI - S55
AMBASSADOR
4:00 PM - 4:45 PM

MAKING MUSIC WITH MATH
Alan Horwitz, *Marshall University*

We always hear that music is related to math, but seldom about how to use math to create musical sounds. We apply concepts from your first few undergraduate years to simulate guitars and drums, create echoes, predict what happens (via the Chain Rule) when you re-parameterize music and more.

Sessions

ENHANCEMENT EFFECTS OF MyMathLab AND WebCT IN A MATH CLASS

Emmett Dennis, *Southern Connecticut State University*

FRI - S56
CONSULAR
4:00 PM - 4:45 PM

An investigation was done to compare the success rates of developmental mathematics students in a traditional face-to-face class with technological enhancement from two different Web-based learning management systems, MyMathLab and WebCT. Both software packages were used as vehicles for communication, and as tools to evaluate student learning. Enhancement effects of both web-based learning systems on student learning will be identified.

Saturday, November 1, 2003

ACTIVITIES AND TECHNOLOGY FOR ENHANCING ACTIVE LEARNING IN A MULTI-SECTION CALCULUS CLASS

Alex Himonas, *University of Notre Dame*

SAT - S59
INTERNATIONAL C
8:00 AM - 8:45 AM

We shall discuss ways for encouraging participation and promoting active learning in a multi-section calculus class, through carefully constructed class activities and taking advantage of the available technology, (Mathematica® and graphing calculators.)

LINEAR PROGRAMMING PROBLEMS - GETTING ALL YOU CAN FROM YOUR TECHNOLOGY

Jim Reynolds, *Clarion University*

SAT - S60
INTERNATIONAL D
8:00 AM - 8:45 AM

Any technology (such as Excel) that does not provide a final simplex tableau when solving a linear programming problem provides no insight into how the solution might change if the constraints change, i.e. sensitivity analysis. This presentation discusses sensitivity analysis in linear programming problems.

JAVA APPLETS FOR TRIGONOMETRY

Michael Mays, *West Virginia University*

SAT - S61
INTERNATIONAL E
8:00 AM - 8:45 AM

Laboratory activities and classroom demonstrations built using Geometer's Sketchpad™ and the Mathematical Java Toolkit are demonstrated. All have been used in trigonometry classes at West Virginia University.

ANIMATIONS OF LINEAR TRANSFORMATIONS AS DEFORMATIONS USING MAPLE®

Jay Treiman, *Western Michigan University*

SAT - S62
INTERNATIONAL F
8:00 AM - 8:45 AM

Often animations of linear transformations are done as discrete transformations. In this talk, we will illustrate one simple method of animating linear transformations as continuous deformations of polygons using Maple®.

DYNAMIC EDUCATION FOR K-8 PRE-SERVICE MATHEMATICS TEACHERS: DELIVERING CONTENT USING WEB-ENHANCED AND ITV MODALITIES

Nancy Priselac, *Garrett College*

Stephen Priselac, *Fayette Institute*

SAT - S63
AMBASSADOR
8:00 AM - 8:45 AM

Come and observe a web-enhanced activity-based content course for K-8 pre-service teachers offered via the Maryland Interactive Distance Learning Network (MIDLN) to students at Garrett College and Hagerstown Community College. These classrooms resemble TV studios where students communicate among studio sites in real time.

USING TECHNOLOGY TO MAKE DRAMATIC IMPROVEMENTS ACROSS UNDERGRADUATE EDUCATION

Frank Wattenberg, *United States Military Academy*

SAT - S64
CONSULAR
8:00 AM - 8:45 AM

Many of us who have been involved in using technology in mathematics education feel as if we have been riding the waves in the ocean. We've been having a ball as the waves carry us to-and-fro, but we've been going back and forth over the same ground. Currently available technology can support dramatic and pervasive changes in undergraduate education if the changes in hardware are matched by changes in what and how we teach. This talk will present specific examples in the context of a grand vision.

Sessions

A NEW FOCUS FOR COLLEGE ALGEBRA AND PRECALCULUS

Sheldon Gordon, *Farmingdale State University*
Florence Gordon, *New York Institute of Technology*
Nancy Baxter Hastings, *Dickinson College*
Bruce Crauder, *Oklahoma State University*
Joe Fiedler, *California State University - Bakersfield*

SAT - S65
INTERNATIONAL A
8:00 AM - 9:45 AM

MAA, AMATYC, and NCTM are collaborating on a national initiative to refocus the courses below calculus to better serve the majority of students. The panel will discuss this effort to encourage courses emphasizing conceptual understanding and realistic applications, not just developing algebraic skills that are needed by only a very small percentage of students.

eLEARNING CLASSROOM: VIRTUAL OR REAL EDUCATIONAL EXPERIENCE?

Roseanne Hofmann, *Montgomery County Community College*

SAT - S66
INTERNATIONAL B
9:00 AM - 9:45 AM

Is the eLearning classroom just glitz or is there value added to the educational experience? Many applications of the eLearning classroom will be discussed, the impact on students, the drain on resources and how the future implications will change tomorrow's eLearning classroom.

HANDS-ON LEARNING IN CALCULUS VIA MAPLETS-BASED PROJECTS

Lew Ludwig, *Denison University*
Keith Howard, *Kenyon College*

SAT - S67
INTERNATIONAL C
9:00 AM - 9:45 AM

We will discuss the Maplelet-based lab format that was collaboratively developed under several grants from the Mellon Foundation for the calculus series. These labs not only use the power of technology to explain news topics, but also engage the students through hands-on explorations and a series of discovery-type questions.

THE LATEST IN TECHNOLOGY AND ASSESSMENT

Frank Demana, *The Ohio State University*

SAT - S68
INTERNATIONAL D
9:00 AM - 9:45 AM

An overview of the latest tools from Texas Instruments that can be used for assessment in classrooms. Specifically, we will describe how the TI-Navigator and TI-Learning Check can be used.

ADVANTAGES AND DISADVANTAGES OF INTEGRATING COMPUTATIONAL SOFTWARE INTO A MODERN APPLIED STATISTICS COURSE

John McKenzie, Jr., *Babson College*
Robert Goldman, *Simmons College*

SAT - S69
INTERNATIONAL E
9:00 AM - 9:45 AM

This session will describe tradeoffs associated with using Minitab™ and Excel in an introductory course. The emphasis will be on practical tips for successfully employing such software in all aspects of the course from in-class demonstrations to projects and exams. We will comment on when to use conceptual software such as free Java applets and commercially-available software such as Fathom™. A packet of relevant examples based upon the latest versions of Minitab™ and Excel will be provided.

BILL CLINTON, BERTIE AHERN, AND DIGITAL SIGNATURES (A MAPLE®-BASED INTRODUCTION TO PUBLIC-KEY CRYPTOGRAPHY)

John Cosgrave, *St. Patrick's College*

SAT - S70
INTERNATIONAL F
9:00 AM - 9:45 AM

A modified version of my public lecture "Bill Clinton, Etc." which illustrates the fundamental concept of public and private key cryptography.

EXPERIENCING TI-NAVIGATOR: AN INTRODUCTION TO INSTRUCTIONAL MODELS

Marlena Herman, Eric Milou, *Rowan University*

SAT - S72
AMBASSADOR
9:00 AM - 9:45 AM

Presenters will discuss their experiences with using TI-Navigator and demonstrate uses of TI-Navigator for teaching and learning mathematics. Means of engaging and monitoring all students using graphing calculators; providing instantaneous feedback; incorporating discovery learning; and collecting, sharing, and analyzing data will be modeled.

Sessions

APPLIED CALCULUS ON THE WEB - AN INTERACTIVE APPROACH TO FRESHMAN CALCULUS

Jennifer Whitfield, Kathryn Bollinger, *Texas A&M University*

SAT - S73
INTERNATIONAL A
10:00 AM - 10:45 AM

Applied Calculus on the Web (ACOW) is a web-based supplement for freshman calculus under development at Texas A&M University. ACOW employs JAVA applets, Flash and interactive tutorials to introduce and explore calculus concepts. We will show several representative modules and discuss their use in the classroom.

BRINGING INTERACTIVE MATHEMATICAL INSTRUCTION TO THE WEB USING INTEGRO TECHEXPLORER TECHNOLOGIES

Sam Dooley, *Integre Technical Publishing*

SAT - S74
INTERNATIONAL B
8:00 AM - 8:45 AM

Creating interactive mathematical courseware for the internet requires software capable of displaying, editing, computing, and interacting with the content and presentation of mathematical expressions. TechExplorer technologies provide a wide range of powerful tools for creating innovative and engaging mathematical learning experiences.

STUDY CARDS™ ON THE TI-83 PLUS

Barbara D'Ambrosia, Carl Spitznagel, *John Carroll University*

SAT - S75
INTERNATIONAL C
10:00 AM - 10:45 AM

We will demonstrate the StudyCard™ application on the TI-83 Plus calculator as well as how to create study cards for your students to use.

MATH CLASS GOES TO HOLLYWOOD: THE SEQUEL

John Hornsby, *University of New Orleans*

SAT - S76
INTERNATIONAL D
10:00 AM - 10:45 AM

The original version of this presentation was given in Baltimore at ICTCM in 2001. The sequel will include more mathematics-related scenes from motion pictures and how they can be used to motivate students in your classroom.

SPREADSHEETS IN LIBERAL ARTS MATHEMATICS

Gisela Ahlbrandt, *Eastern Michigan University*

SAT - S77
INTERNATIONAL E
10:00 AM - 10:45 AM

Spreadsheets give students the opportunity to solve problems, which would be otherwise too challenging for their algebra background, computational skill or stamina. We explore finance charges on a credit card, minimum wage, lump sum value of a lottery win, simulations of coin tosses, linear programming and more.

VISUAL LINEAR ALGEBRA

Eugene Herman, *Grinnell College*

Michael Pepe, *Seattle Central Community College*

SAT - S78
INTERNATIONAL F
10:00 AM - 10:45 AM

In this approach to linear algebra, the course materials help students develop visualization skills that enable them to acquire strong geometric intuition about the fundamental concepts. Moreover, this learning takes place in a dynamic, computing-intensive environment in which students are actively engaged in constructing their understanding of linear algebra.

MATH TOOLS - A NEW MATH FORUM PROJECT

Gene Klotz, *Swarthmore/Math Forum*

SAT - S79
AMBASSADOR
10:00 AM - 10:45 AM

Math Tools is an NSF-funded digital library of software for teaching math. All platforms - computer and handheld, grades pre-K through calculus. We are building a community of software developers and teachers to help build the right software and help teachers in its use.

Sessions

MAPLE T.A.™ - A NEW AUTOMATED TESTING AND ASSESSMENT ENVIRONMENT, SPECIFICALLY FOR MATHEMATICS EDUCATORS

Tom Lee, *MapleSoft*

SAT - S80
CONSULAR
10:00 AM - 10:45 AM

Until now, no testing and assessment software has included the power of a computer algebra system to evaluate student responses. Maplesoft is proud to introduce Maple T.A.™, the first testing and assessment environment that uses the power of Maple® to automatically grade student responses. This session will demonstrate the effectiveness of the Maple T.A.™ platform, in the following areas: Placement and gateway testing, homework and drills, assignment and delivery, tests, quizzes and exams.

INTRODUCTION TO PDF AND JAVASCRIPT

Scott Randby, *University of Akron*

SAT - S81
INTERNATIONAL A
11:00 AM - 11:45 AM

A discussion of the advantages and disadvantages of posting mathematical documents as PDF files. The processes of creating and viewing a PDF file will be explained. Basic JavaScript will be discussed, and a method of using JavaScript to create interactive PDF documents will be examined.

IF MATH TURNS YOU OFF...TURN ON A COMPUTER

Robert Khouri, *Wisconsin Technical College System Foundation, Inc.*

SAT - S82
INTERNATIONAL B
11:00 AM - 11:45 AM

Why do some otherwise good students struggle in math? This session identifies some factors common in math classrooms and textbooks. It then demonstrates how multimedia instruction addresses this set of problems by combining the impact of visual images, warmth of audio narration and flexibility/patience/responsiveness of the computer.

MATHEMATICAL MODELING AND APPLIED CALCULUS: PERFECT TOGETHER TO TEACH PROBLEM SOLVING

Bruce Pollack-Johnson, Audrey Borchardt, *Villanova University*

SAT - S83
INTERNATIONAL C
11:00 AM - 11:45 AM

To apply calculus, or any other mathematical tool, to real world problems we must formulate and solve a mathematical model of a problem. But this involves only two of the five steps of solving real problems. We should teach students all of the other steps in solving real problems too.

SPREADSHEETS AND ALGEBRA: WHAT'S THE CONNECTION?

Deborah Hughes Hallett, William McCallum, *University of Arizona*

SAT - S84
INTERNATIONAL D
11:00 AM - 11:45 AM

Spreadsheets can be used to represent algebraic relationships between variables in a way that is very different from traditional algebraic notation. The spreadsheet representation is halfway between the numerical and the symbolic worlds. We will explore how it can be used to give students a sense of symbolic form by making clearer the common sense numerical basis for algebraic rules.

USING SIMULATION TO RELATE EXPERIMENTAL AND THEORETICAL PROBABILITY

Don Collins, *Western Kentucky University*

SAT - S85
INTERNATIONAL E
11:00 AM - 11:45 AM

Joe DiMaggio's 56 game hitting streak, how phenomenal was it? What is the likelihood that it will ever be broken? An examination using experimental and then theoretical probability.

TANK TIME: STRUCTURED MAPLE® PROJECTS FOR DIFFERENTIAL EQUATIONS

Joseph Fady, *Southern Polytechnic State University*

SAT - S86
INTERNATIONAL F
11:00 AM - 11:45 AM

The presenter will demonstrate a series of Maple® projects which relate to a cascade of Brine Tanks. The projects are "structured" in the sense that they are in the form of MAPLE worksheets that contain discussions, commands, animations, etc., along with a number of questions to be answered by students. Assumed student knowledge of Maple® is minimized in these projects.

A WEB COURSE FOR IN-SERVICE HIGH SCHOOL MATHEMATICS TEACHERS

Gary Harris, *Texas Tech University*

SAT - S87
AMBASSADOR
11:00 AM - 11:45 AM

We describe our online, graduate level mathematics course for in-service mathematics teachers who are pursuing a Master of Arts degree in Mathematics from our department. The course uses WebCT, Maple® and LOGO.

Sessions

LIFE BEFORE CALCULUS? MEET THE LOGISTIC EQUATION

Peter Tannenbaum, *California State University - Fresno*

SAT - S88
CONSULAR
11:00 AM - 11:45 AM

In this talk, the presenter will discuss some of the most interesting aspects of the logistic equation (fixed points, cycles, cobweb diagrams, bifurcation maps, etc.), focusing primarily on how this material can be presented at a pre-calculus level. Experiences teaching the topic in a liberal arts mathematics course will also be touched upon.

CAN YOU HEAR ME?

Amy Del Medico, *Waubonsee Community College*

SAT - S89
INTERNATIONAL A
12:00 PM - 12:45 PM

A discussion of my journey through a semester teaching calculus for business and social science using HorizonLive to facilitate real-time interactive online learning. Blending HorizonLive with WebCT, streaming audio, visual tools and student-instructor interaction will be explored as well as the technical aspect of teaching in this format.

MUNDANE AND CREATIVE IN WEB-BASED MATHEMATICS

Fedor Andreev, *Western Illinois University*

SAT - S90
INTERNATIONAL B
12:00 PM - 12:45 PM

The author develops and uses an online homework system to train the routine. He also works on JAVA applets, demonstrating the "cool" side of math. Why can't he use the same software tools to do both? A way to unite the mundane and creative aspects of web-based mathematics is proposed.

A WEB-BASED (WEBCT) INTRODUCTORY COURSE IN DIFFERENTIAL AND INTEGRAL CALCULUS

Ann Robertson, *Connecticut College*

SAT - S91
INTERNATIONAL C
12:00 PM - 12:45 PM

This one semester calculus course places emphasis on understanding key concepts, solution of problems, highlights from an historical perspective, and current real-life applications. Technology is used as a visual and reference tool; animations are obtained from the Internet. A Mathematica[®] lab illustrates Newton's Method with an example exhibiting chaotic behavior.

GAMING SIMULATIONS IN PROBABILITY

Julie Belock, *Salem State College*

SAT - S92
INTERNATIONAL D
12:00 PM - 12:45 PM

Activities to investigate the probability distributions of games such as Bingo and others will be presented. Simulations on the TI-83 and Excel are used to pave the way to student understanding of the theoretical distributions. Originally developed for an upper-level probability course, selected activities have been adapted for introductory statistics.

TIPS AND TRICKS FOR USING DERIVE™

Theresa Shelby, *Texas Instruments*

SAT - S93
INTERNATIONAL E
12:00 PM - 12:45 PM

Learn how to quickly format a math document replete with mathematical expressions, text, graphics, and embedded objects; use the dock-able toolbars, expression entry line, format and progress bar, plot inequalities in 2D and rotate 3D plots. These tips and more will be shared, followed by answers to frequently asked questions.

CIRCUITS, TANKS, AND MATHEMATICAL MODELS

Allen Struthers, *Michigan Technological University*

SAT - S94
INTERNATIONAL F
12:00 PM - 12:45 PM

This presentation demonstrates high quality computer data collection for standard electric circuit and tank mixing problems modeled in Ordinary Differential Equation (ODE) courses. The experiments and analysis use inexpensive equipment and standard software. The collected data validates standard ODE model predictions with surprising accuracy for most students and faculty members.

A COMPUTER APPROACH TO COLLEGE GEOMETRY USING THE GEOMETER'S SKETCHPAD™

Barbara Reynolds, *Cardinal Stritch University*

SAT - S95
AMBASSADOR
12:00 PM - 12:45 PM

Materials for College Geometry using the Geometer's Sketchpad™ will be presented. The focus of this course is on developing skills in writing mathematical proofs. Computer explorations using Sketchpad™ introduce all topics. Students work on activities, making and testing conjectures. Class discussion leads to developing proofs (or refutations) of students' conjectures.

Sessions

TEACHING MORE EFFICIENTLY AND EFFECTIVELY WITH TECHNOLOGY

SAT - S96
CONSULAR
12:00 PM - 12:45 PM

Iris Fetta, Sherry Biggers, *Clemson University*

Students rely on class notes to recall lectures. PowerPoint presentations can effectively help students organize and improve note-taking skills. Less time spent taking notes results in more time interacting with course materials. This talk demonstrates ways to interweave visuals, calculator activities, and student participation in an innovative applied calculus course.

TEACHING TEACHERS IN ZIMBABWE ABOUT TECHNOLOGY

SAT - S97
INTERNATIONAL A
1:00 PM - 1:45 PM

Stuart Moskowitz, *Humboldt State University*
James Tarvin, *Grossmont College*

We bring calculators and training to Zimbabwean mathematics teachers. We bring back a much expanded view of mathematics education. Come for an international perspective on education and learn how you can help provide equipment and support.

FINITE MATH ON THE WEB - CORE MATHEMATICS DELIVERED VIA THE WEB

SAT - S98
INTERNATIONAL B
1:00 PM - 1:45 PM

Janice Epstein, Michael Pilant, *Texas A&M University*

Finite Math on the Web (FMOW) is a web-based supplement for a traditional Finite Math course. FMOW utilizes JAVA applets and interactive tutorials to introduce and explore the major topics covered in a typical freshman course. We will discuss the development and implementation of FMOW at Texas A&M University.

USING (PALM OS) PDA'S IN CALCULUS I AND II

SAT - S99
INTERNATIONAL C
1:00 PM - 1:45 PM

Abigail Hoyt, Allen Rogers, *Elmhurst College*

Through the support of an Ameritech grant, we have recently revamped our introductory calculus courses to incorporate the PDA (using Palm OS). We will share our experiences in introducing this relatively inexpensive yet powerful technology into the calculus sequence.

USING SCRIPT, PROGRAMS, AND PICTURES WITH THE ANSCOMB DATA

SAT - S100
INTERNATIONAL D
1:00 PM - 1:45 PM

Thomas Kline, *University of Northern Iowa*

If you use the ANSCOMB data to illustrate the danger of over-reliance upon the correlation coefficient, then consider writing a script for either a TI-92+ or Voyage 200 to organize the presentation.

LIBERAL ARTS MATH FOR SURVIVAL: INTERNET, WEB-ASSISTED AND CLASSROOM FORMATS

SAT - S101
INTERNATIONAL E
1:00 PM - 1:45 PM

Joseph Sukta, *Moraine Valley Community College*

Participants learn a problem-solving approach to realistic problems involving car and home purchases, refinancing, home renovation, saving strategies, descriptive statistics and probability. Student projects, examples of students' work and Moraine Valley's online Liberal Arts Math course are shared. This course is also taught in web-assisted and traditional classroom formats.

FROM PYTHAGORUS TO PICK USING TECHNOLOGY: EXCERPTS FROM A MATHEMATICS TEACHER EDUCATION COURSE

SAT - S103
AMBASSADOR
1:00 PM - 1:45 PM

Sergei Abramovich, *SUNY College at Potsdam*
Andrew Brantlinger, *Northwestern University*

This presentation reflects on several innovative uses of spreadsheets with pre-service teachers of mathematics that have a potential to provide the teachers with a research-like experience needed for successful teaching at the secondary school level and can result in their appreciation of mathematical concepts as tools in computing applications.

CAN TECHNOLOGY HELP PREDICT THE DYNAMICS OF STUDENT ATTITUDES TOWARD MATHEMATICS?

SAT - S104
CONSULAR
1:00 PM - 1:45 PM

Zaur Berkaliyev, *California State University - Fresno*

This presentation demonstrates that the dynamical system of college student attitudes toward mathematics provides complex irregular nonlinear patterns similar to patterns provided by strange attractors. The major features of such dynamics are unpredictability and instability, which might not be a result of measurement error, but the very nature of the phenomenon.

REAL STUDENT INVOLVEMENT WHILE LEARNING MATHEMATICS

SAT - S105
INTERNATIONAL A
2:00 PM - 2:45 PM

Nancy Ressler, *Oakton Community College*

What can help to support student learning, develop content understanding and help to keep students current when classes are missed? Video taped student presentations, interactive practice problems, guided solutions, homework problems, a grade book, test creation and Excel spreadsheets will be viewed. Demonstrations of how you can embellish and personalize what you expect your students to learn will be available.

Sessions

SAT - S106
INTERNATIONAL B
2:00 PM - 2:45 PM

DEVELOPING SIMULATIONS AND DEMONSTRATIONS USING MICROSOFT VISUAL C++

Mike O'Leary, *Towson University*

We shall show participants how to use Microsoft Visual C++ to create computer simulations and demonstrations that take full advantage of new computer's graphical capabilities. Some programming experience is required.

SAT - S107
INTERNATIONAL C
2:00 PM - 2:45 PM

USING CONCEPTTESTS IN SINGLE AND MULTIVARIABLE CALCULUS

Maria Robinson, *Seattle University*
David Lomen, *University of Arizona*

This session will give participants experience using ConceptTests to promote the discussion and learning of concepts in classes of single and multi-variable calculus. They will also see how recent and emerging technologies can aid in their use.

SAT - S108
INTERNATIONAL D
2:00 PM - 2:45 PM

IS POPCORN NORMAL?

Allen Struthers, *Michigan Technological University*

Popcorn pops are commonly assumed to be normally distributed. This presentation tests this normalcy hypothesis with a straightforward classroom experiment. Every pop in a batch of popcorn from a hot air popper is recorded, timed, and analyzed using inexpensive equipment and standard software. Popcorn will be served.

SAT - S109
INTERNATIONAL E
2:00 PM - 2:45 PM

USING TECHNOLOGY FOR TEACHING MATHEMATICS IN THE VISUAL COMMUNICATION ARTS

Khoi Nguyen, Shyla McGill, *Columbia College Chicago*

Examples of integrating technology in mathematical teachings of image manipulation, acoustics, and multimedia installations are presented. In addition, specific examples of using mathematics in our personal artwork will be demonstrated.

SAT - S110
INTERNATIONAL F
2:00 PM - 2:45 PM

TEACHING ABSTRACT ALGEBRA WITH GAP

Julianne Rainbolt, *Saint Louis University*
Kevin Anderson, *Missouri Western State College*

GAP is a system for computational discrete algebra. Presenters will outline the main features of GAP, discuss how it can be used in teaching Abstract Algebra, and provide web-page links to labs and other materials. Specific examples of gap projects for abstract algebra will be distributed and discussed.

SAT - S111
AMBASSADOR
2:00 PM - 2:45 PM

A LESSON PLAN FOR TEACHING TEACHERS

Mary Ellen Davis, Virginia Parks, *Georgia State University*

Many students enter a Mathematics for Elementary Teachers course with the ability to perform standard mathematical procedures but lack an understanding of the concepts underlying these procedures. The speakers will provide background information about the 2-year/4-year college collaboration and a sample of activities for pre-service teachers.

SAT - S112
CONSULAR
2:00 PM - 2:45 PM

PROS AND CONS OF ELECTRONIC QUIZZES FROM THE STUDENT'S PERSPECTIVE

Joseph Aieta, *Babson College*

A minimum of 8 electronic quizzes and 8 paper and pencil quizzes were given in five sections of a quantitative methods course for business students taught by two instructors. This session will report on student feedback based upon formal surveys given at the beginning and end of the semester.

SAT - S113
INTERNATIONAL A
3:00 PM - 3:45 PM

ANATOMY OF MATHEMATICAL AND STATISTICAL INQUIRY IN "TECHNOLOGY INTENSIVE" INTRODUCTORY REQUIRED COURSES

Stephen Turner, *Thomas College*

This session will be an exploration that compares and contrasts "traditional" with "technologically intensive" methods of inquiry in introductory required courses. The overview will incorporate illustrations from the speaker's extensive experience at multiple institutions so that conceptual principles are clarified by example.

Sessions

USING EXCEL TO VISUALIZE TOPICS IN COLLEGE ALGEBRA AND TRIGONOMETRY

Paul O'Heron, *Broome Community College*

SAT - S114
INTERNATIONAL B
3:00 PM - 3:45 PM

We will demonstrate how student written and pre-written Excel spreadsheets can help students understand and visualize vector addition, the law of sines and cosines, parametric equations, modeling temperature, and semilog graphs.

VISUALLY ENRICHING PRECALCULUS AND CALCULUS LECTURE WITH 'CONVERGE' AND 'DPGRAPH'

Arun Verma, *Hampton University*

SAT - S115
INTERNATIONAL C
3:00 PM - 3:45 PM

The lecture classes in Pre-calculus through Calculus III were supplemented with graphical visualization software Converge and dynamic photo-realistic 3D graphing software DPGraph. The effective use of these software packages in an electronic classroom EMIT will be presented.

WHAT TO TELL YOUR STATS STUDENTS AND WHEN TO TELL THEM

Paul Velleman, *Cornell University*

SAT - S116
INTERNATIONAL D
3:00 PM - 3:45 PM

An introductory Statistics class covers material selected from a large body of knowledge. You must choose what not to say what order to present new concepts and methods. Wise choices of what to leave for later or to leave out altogether can help smooth the way for students.

EXPLORE MATH WITH THE TI-89

Shin Watanabe, *Tokai University*

SAT - S117
INTERNATIONAL E
3:00 PM - 3:45 PM

This presentation will explore math with the TI-89.

MODELING WITH THE TERROR BIRD

William Fox, *Francis Marion University*

SAT - S118
INTERNATIONAL F
3:00 PM - 3:45 PM

We will discuss Models for the Terror Bird that explore models from College Algebra using exponential and natural logs through models from Numerical Analysis involving divided difference tables and cubic splines.

COLLEGE/HIGH SCHOOL PARTNERSHIPS TO IMPROVE STUDENT PERFORMANCE

Tom Morley, *Georgia Institute of Technology*

SAT - S119
AMBASSADOR
3:00 PM - 3:45 PM

In this talk we describe some Georgia Tech partnerships with local high schools. These are intended to improve student AP math performance. The math technology component is the use of a collaborative web site.

SHORTCOMINGS AND MISUSES OF TECHNOLOGY (MAPLE®, TI CALCULATORS) IN UNDERGRADUATE MATHEMATICS

Reza Abbasian, John Sieben, *Texas Lutheran University*

SAT - S120
CONSULAR
3:00 PM - 3:45 PM

We will present examples using CAS (Maple®) and graphing calculators (TI-89, Voyage 200). These case studies are intended to demonstrate some of the inaccuracies and misinterpretations associated with the use of technology in teaching undergraduate mathematics.

RANDOM TEST GENERATION USING MICROSOFT WORD MACROS

Evan Siegel, *City University of New York*

SAT - S121
INTERNATIONAL A
4:00 PM - 4:45 PM

Using MS Word macros, we send very light-weight files that generate arbitrarily large practice sheets of considerable complexity on a broad range of topics of the students' choosing. These macros can even be written to check the students' answers.

Sessions

WORKBOOK EMULATION: THE SCANDALOUS STATE OF INSTRUCTIONAL MATH SOFTWARE

John Miller, *The City College of New York*

SAT - S122
INTERNATIONAL B
4:00 PM - 4:45 PM

Most instructional software emulates workbooks, using short answer problems with "canned" solutions. Intelligent, step-by-step help during problem solving is shockingly rare, yet surprisingly simple to provide. Adopters should individually and collectively demand intelligent instructional software from publishers, and every Internet-based course should provide such support.

TI-INTERACTIVE - GETTING INVOLVED

Harry Gretton, *Sheffield Hallam University, United Kingdom*

SAT - S123
INTERNATIONAL C
4:00 PM - 4:45 PM

A short foray into some of the exciting aspects of the powerful software Ti-Interactive.

FRACTAL IMAGES ON THE GRAPHING CALCULATOR

Lisa Yocco, *Georgia Southern University*
John Diehl, *Hinsdale Central High School*

SAT - S124
INTERNATIONAL D
4:00 PM - 4:45 PM

A demonstration of a calculator program and matrices to generate fractal images such as snowflakes, ferns, and trees. The demonstration will show versions for the TI-83 Plus Silver edition and Voyage 200.

AN INVESTIGATION OF EFFECTIVE INSTRUCTIONAL STRATEGIES AND STUDENT ENGAGEMENT FOR TEACHING COLLEGE CALCULUS

Susan Henderson, *Queens College*

SAT - S125
INTERNATIONAL E
4:00 PM - 4:45 PM

This presentation reports on a study with two purposes. The first is to determine the differences, if any, in learning with online discussion groups versus face-to-face. The second is to investigate student attitudes about discussing mathematics online.

TEACHING LINEAR ALGEBRA USING ADAPTIVE BOOK AND INTERACTIVE MAPLE® FUNCTION

Elias Deeba, *University of Houston - Downtown*
Ananda Gunawardena, *Carnegie Mellon University*
Pramod Kanwar, S.K. Jain, *Ohio University*

SAT - S126
INTERNATIONAL F
4:00 PM - 4:45 PM

In the first half of this presentation, we will demonstrate how to integrate all components of a Linear Algebra course using Adaptive Book, a new technology platform for managing content. Adaptive Book allows users to create interactive markup objects, archive and share them with other users. In the second half, we revisit our approach to creating a highly interactive text for teaching linear algebra using Maple®. In particular, we will describe and demonstrate how a newly developed technology lends itself naturally to creating such texts. Within this new framework, we will demonstrate some exciting projects, labs and interactive lessons.

A COMPREHENSIVE TECHNOLOGY-INTENSIVE CURRICULUM IN ADVANCED SECONDARY MATHEMATICS

Joanne Mason, *The Harker School*

SAT - S127
AMBASSADOR
4:00 PM - 4:45 PM

This session reports on a comprehensive upper-level mathematics curriculum developed at a new California independent school. This advanced curriculum - in which all students use laptops, and which encompasses coursework from pre-calculus to well beyond AP Calculus - features intensive use of Mathematica® and other software, extensive web resources and networking, and student projects and presentations. We discuss issues involved with developing and implementing such technology-oriented curriculums; describe the specific content of the curriculum; demonstrate projects done by students; and report preliminary results and observations about program outcomes.

USING PROJECTS AND TECHNOLOGY TO INFUSE EMPLOYABILITY SKILLS IN LIBERAL ARTS MATHEMATICS

Nancy Johnson, John Waters, *Manatee Community College*

SAT - S128
CONSULAR
4:00 PM - 4:45 PM

Manatee Community College was awarded a grant by the Dept. of Education to facilitate integration of employability skills into the general education curriculum thereby adding value to the A.A. degree. Specifically, the Liberal Arts Mathematics course was enhanced by including individual team projects that required students to exercise critical thinking and use appropriate technology.

Sessions

SAT – S129 INTERNATIONAL A 5:00 PM - 5:45 PM	HOW CAN A LogiTech io PEN™ BENEFIT MATHEMATICS TEACHERS? Karen Anglin, <i>Blinn College</i> The Logitech io Pen™ can help you communicate with your students, keep you organized, save time, increase efficiency, ease writing articles for journals, equations and figures for books, and more.
SAT - S130 INTERNATIONAL B 5:00 PM - 5:45 PM	MATHEMATICAL COMMUNICATION IN A WEB-SUPPORTED UNDERGRADUATE GEOMETRY CLASS David Thomas, <i>University of Idaho</i> Lessons learned in the development and delivery of a web-supported undergraduate geometry course.
SAT - S131 INTERNATIONAL C 5:00 PM - 5:45 PM	USING DERIVE™ TO HELP STUDENTS VISUALIZE CURVES AND SURFACES IN 3D Thomas Wangler, <i>Benedictine University</i> Students have a hard time visualizing and drawing mathematical objects in 3D. In this talk, the presenter will show how to use Derive™ to help students visualize curves and surfaces in 3D. Come see the "tube" and the "slide" and how Derive™ is used to make them both.
SAT - S133 INTERNATIONAL E 5:00 PM - 5:45 PM	PRECALCULUS: CONCEPTS IN CONTEXT Marsha Davis, Hortencia Garcia, <i>Eastern Connecticut State University</i> This session presents a model approach to pre-calculus. Mathematics appears in context, and contextual problems motivate development of the mathematics needed to solve them. Samples of technology-based labs, projects, and explorations, key components of this approach will be presented. Student performance and reactions from other departments will be shared.
SAT - S134 INTERNATIONAL F 5:00 PM - 5:45 PM	USING WebWork IN LINEAR ALGEBRA Thomas Hagedorn, <i>The College of New Jersey</i> Participants will receive an overview of the WebWork system for computer-graded homework. Linear Algebra materials developed and used at the College of New Jersey for WebWork will be demonstrated.
SAT - S135 AMBASSADOR 5:00 PM - 5:45 PM	MY STUDENT KNOWS THE MATHEMATICS, BUT HAS NEVER USED THE GRAPHING CALCULATOR Teresa McCullough, <i>Montgomery College</i> Students in our math program start using TI calculators in Intermediate Algebra. Students enter the curriculum at any stage, and may know the prerequisite math but not the calculator. We provide instructional workshops for these students. This presentation will give a detailed discussion of our problem and our solution.
