SESSION I

Friday, 9:00 – 9:50a

Critical Mathematics and Ethnomathematics: An Introduction

Presenter: German Moreno, Dona Ana Community College

The presenter will introduce the audience to the critical mathematics and ethnomathematics paradigms focusing primarily on what these perspectives might mean for mathematics education. Because these perspectives take the view that mathematics educators and learners have a social responsibility, looking at education through these lenses means going past cognitivist notions of what it means to learn. Furthermore, these perspectives may be important to consider for educators of diverse populations.

Friday, 9:00 – 9:25a

Fun with Fibonacci: Teaching Outside the Developmental Math Box

Presenter: Pat Barrientos, El Paso Community College

This presentation is geared towards those who teach developmental math courses, but everyone is most welcome! Participants will be shown how Fibonacci can be integrated into the developmental math curriculum by having students explore patterns. Come and explore Fibonacci in nature, in poetry, and even in a different way to multiply!

Using Journal Articles in Math Classes

Presenter: Brian Pasko, Eastern New Mexico University

Undergraduate journal articles are useful for showing students applications of various abstract principles they are learning. Articles often allow for real-world experimentation and/or demonstration using physical equipment. I will specifically address an undergraduate journal article concerning rainbows and a graduate article concerning projectile motion subject to air resistance. I will focus this talk on how to use such articles by giving examples of implementing these into the curriculum as well as lessons learned over several years of doing so.

Friday, 9:30 – 9:55a

More Course Outcome Control for You & Your Students with Statistics

Presenter: John Patrick, Dona Ana Community College

By applying four principles to your course process, you and your students can gain more control over course outcomes. Energies can be focused on areas of need rather than scattering efforts over course content. 1st principle: Students & instructor must work from a set objective list. 2nd principle: At least 80% of objectives must be mastered. 3rd principle: Use non-destructive testing; only final exams are used for grades. 4th principle: Sample all objectives randomly at least weekly. Examples of class applications will be provided with hands-on experiences with random sample testing and statistical charting of data.

SESSION II

Friday, 10:00 – 10:50a

EPCC Math Emporium: Then and Now

Presenter: Diana Orrantia, El Paso Community College

This presentation will talk about what the EPCC math emporium looked like in Spring 2009, its changes, and its current state in the Spring of 2011. The components, some statistics, and software used will be discussed.

What is Golden about the Regular Pentagon?

Presenter: Rita Eisele, New Mexico State University-Alamogordo

The regular pentagon contains many occurrences of the golden ratio. Participants will be shown a proof of one of these occurrences and then participate in the discovery of others. Participants will also learn how to construct a regular pentagon with compass and straightedge using the concept of the golden ratio. The construction will also be demonstrated with Geometer's Sketchpad.

Friday, 10:00 – 10:25a

The Jump from 2 to 3 is Bigger than it Seems: Recent Attempts at Generalizing Hadamard Matrices

Presenter: Charles Katerba, Northern Arizona University

Hadamard matrices can be generalized in a number of ways, including where the entries in the matrices come from and the dimension of the arrays themselves. The presentation will outline recent attempts at generalizing the Paley Construction of Hadamard matrices to create Butson Hadamard matrices with entries from the set of complex cubic roots of unity and establish a standard definition of Hadamard hypercubes.

Friday, 10:30 – 10:55a

Where is the Logic in Student-Constructed Proofs?

Presenter: Milos Savic, New Mexico State University

Often university mathematics departments teach some formal logic early in a transition-to-proof course in preparation for teaching undergraduate students to construct proofs. Logic, in some form, does seem to play a crucial role in constructing proofs. Yet, this student of forty-two student-constructed proofs of theorems about sets, functions, real analysis, abstract algebra, and topology, found that only a very small part of those proofs involved logic beyond common sense reasoning. Where is the logic? How much of it is just common sense? Does proving involve forms of deductive reasoning that are logic-like, but are not immediately derivable from predicate or propositional calculus? Also, can the needed logic be taught in context while teaching proof-construction instead of first teaching it in an abstract, disembodied way? Through the theoretical framework emerging from a chunk-by-chunk analysis of student-constructed proofs and from task-based interviews with students, I try to shed light on these questions.

SESSION III ~ Featured Presentation

Friday, 11:00 – 11:50a

Calculus – A New Era for eBooks

Presenter: Eric Schulz, Walla Walla Community College

Eric is the creator of a new generation interactive eBook for calculus which contains 650 interactive 2D/3D figures that appear seamlessly with all of the narrative text, examples, exercises, etc. normally found in a printed calculus textbook. The interactive figures are designed to help students develop an intuitive, geometric understanding of important calculus principles while providing instructors with time-saving and pedagogically sound teaching tools. Eric will discuss the effects of using the interactive eBook and how it has changed the way he teaches and the way students are able to learn calculus. The complete eBook is built using Mathematica, however no knowledge of Mathematica is necessary for using the book (no Mathematica code is visible anywhere in the eBook) and readers of the book only need the freely available Mathematica Player software.

SESSION IV

Friday, 1:00 – 1:50p

Critical Thinking in Intermediate Algebra

Presenter: Catherine Aguilar-Morgan and Rita Eisele, NMSU-Alamogordo

A typical in-class exam measures basic skills and the ability to solve “story problems.” These story problems are usually modeled by the instructor during class and don’t measure a student’s ability to apply concepts to new situations. This presentation will demonstrate how critical thinking assignments can be used as an assessment tool in intermediate algebra.

Commercial Presentation: Meet Your Students in an Interactive Math Classroom

Presenter: Tom Hibbs, Texas Instruments

All the buzz words come to life with your students in an IMC (interactive math classroom) – interactive, connected, formative assessment, immediate feedback, less work grading papers, student's presenting, problem solving, engaging… (Have we left any out?) Take a quick look at the new color handhelds and the newest TI Navigator that communicates through the handhelds. See why the TI-Nspire handheld is not last year's graphing calculator.

Friday, 1:00 – 1:25p

Simulation Analysis of the Game Theoretic Optimal Land Percentage in Magic: the Gathering

Presenter: Tom Brown, Eastern New Mexico University

Magic: the Gathering (MTG) is a collectible card game created by the mathematics professor Richard Garfield in 1993. It is estimated that six million players in over seventy countries play the game. A simulation was written that provides a model of a simplified version of MTG. The simulation allows the user to vary certain deck and game parameters and observe the average effect on the probability that either player wins the game. It is conventional wisdom amongst MTG players that a typical deck should consist of approximately forty percent lands. This provides a good balance between having enough mana (derived from lands) to cast creature spells and having enough creatures to reduce the other player's life total to zero. Using the simulation, a game theoretic optimal land percentage was quantified for each player that depends on the distribution of creatures in their deck.

Friday, 1:30 – 1:55p

A Capstone Course for Future High School Mathematics Teachers

Presenter: Helmut Knaust, University of Texas at El Paso

Mathematics majors with a minor in Secondary Education at UTEP take a course called "Fundamental Mathematics from an Advanced Standpoint." We will talk about the design and implementation of this senior level course and report on the successes and challenges encountered.

SESSION V

Friday, 2:00 – 2:50p

Investigating Student Learning Capacities and Promoting Learning

Presenter: Fariba Ansari, El Paso Community College

According to the local research here at EPCC that I have done for the past two years, it was very interesting to discover that students like to be part of lecturing in the classroom and presenting material that they never thought that they could present in front of class. The base of the research was to make students in a group of four present a new chapter with a rubric to follow. A survey of all students showed that they did better in their learning and had an ownership of what they learned so they could pass it on, as they were future teachers.

Predicting the Winner of a Racquetball Match

Presenter: Brian Pasko, Eastern New Mexico University

Scoring in racquetball is different than most other racquet sports – only the player currently serving can score a point and the winner of a game need only win by one point. We will model the outcome of a game, and thus match, using the likelihood that each player will score a point while serving. The resulting infinite sequence is cumbersome but very instructive. We will compare and contrast a theoretical approach with a computer-based simulation.

Friday, 2:00 – 2:25p

Pop culture figures in exercises and course projects in Introductory Statistics: A unique opportunity for emphasizing all four major institutional student learning outcomes

Presenter: Alan Mabry, Dona Ana Community College

Contrived problems in statistics can be so unimaginative that any emotional involvement in the problem-solving process is hopeless. Statistics is much easier to learn when each question is very relevant to the student, either for the subject matter (e.g. the student's major) or the entertainment value. Entertaining examples and exercises created involving popular culture figures are amusing to students. Using several recurring figures/themes (e.g. Sea Monkeys) throughout the course, the exercise assignments prepare students for a course project. The course project illustrates that statistics is a rather rare course subject that can provide an opportunity to measure the four major general education student learning outcomes at DACC in a single assignment.

Friday, 2:30 – 2:55p

Making Math Fun through Games and Songs

Presenter: Rocio M. Bishop, El Paso Community College

A variety of fun techniques to lead students into a different way of learning math…instead of teacher + blackboard + students, we'll have fun + math + students! We'll learn math through rap songs, jokes, games, and more.

SESSION VI

Friday, 4:00 – 4:50p

How to Teach Infinity

Presenter: Melinda Camarillo and Gabriel R. Camacho, El Paso Community College

This workshop will discuss strategies and techniques to teach the philosophical and mathematical concept of infinity. It will briefly discuss the history of infinity, the work of important infinity scholars as well as the nature of the philosophical problems and mathematical issues that arise from analysis of this fascinating concept. Specific pedagogical tools will be shared to help you enhance your efforts to teach this challenging subject matter. An effort will be made to approach infinity from both a philosophical and mathematical point of view to make the concept even more engaging.

Unit Analysis in Algebra and Elementary Calculus: Benefits & "Cuidados"

Presenter: Clifton Murray, University of New Mexico-Valencia

Unit analysis as done in introductory physics can be useful with application problems in algebra. It can be helpful with applied problems in calculus as well, although some calculus and calc-based physics texts do not do much in this regard. Simple examples of how unit analysis can be clarifying in applied math problems will be presented and, along the way, a couple of "road hazards" will be pointed out.

<u>Commercial Presentation</u>: Using the ClassPad to Visualize Mathematics

Presenter: Diane Whitfield, Casio

We will do Algebra to Calculus-level activities designed to introduce the ClassPad, and to show how this tool can be used in lectures or individually to increase student interest in math. No experience is needed. One ClassPad 330 handheld will be given away!

Saturday, 8:00 – 8:50a

NMMATYC Annual Business Meeting

Grab your continental breakfast and join us for our annual business meeting to see what's happening in *your* NMMATYC!

SESSION VII

Saturday, 9:00 – 9:50a

Embracing Technology in Developmental Mathematics

Presenter: Joan Brown and Mary Beth Williams, Eastern New Mexico University

Today's typical students come to college with more technology-savvy than students at any time prior. Thus incorporating technology into the classroom today meets with much less resistance than even two years ago. We will describe and show you how we have joined the technology era and how that change has dramatically improved our students' success beyond anything we have tried in the past. Enhancements we will present include tablet PCs, lecture guides, wireless projectors, document cameras, laptop carts, computer labs, lesson videos, and homework software.

Mathematics of Wind Energy Production

Presenter: Philip Kaatz, Mesalands Community College

Mesalands Community College has recently added an Associate of Applied Science program in Wind Energy Technology to train wind turbine technicians. In this talk I will describe a project developed for College Algebra students that gives a brief overview of wind energy technology. Students are exposed to a variety of simple mathematical models that can be used to describe the production of energy from wind turbines.

A Synchronous Communicative Feedback Strategy to Enhance Students' Collaborative and Interactive Learning in the Classroom

Presenter: Enayat Kalantarian, El Paso Community College

There are many factors, such as lack of confidence, lack of solid background in mathematics, and feeling shy to speak up, that cause students to get distracted and thus easily lose attention from the instruction in their classes. Typically, traditional lecturing lacks student engagement and interaction. It makes it difficult for the instructor to promptly realize the level of student understanding in the classroom. In this experimental work, I will demonstrate how an effortless feedback mechanism can help improve instruction as well as raise student and collaborative learning interaction to overcome the above problems in a math class. This method encourages students to freely interact and exchange opinions with the instructor and their classmates regarding each subject at several times in the class period. The learning level of students will be evaluated and examined from the responses by the students and subsequently by their earned grades in the class.

SESSION VIII

Saturday, 10:00 – 10:50a

Accelerated Developmental Math Classes Model

Presenter: Ali Ahmad, Dona Ana Community College

Are you interested in developing accelerated developmental math classes? Please join us to discuss what works and what does not work in our model at Dona Ana Community College.

Heading for Infinite: The Saga of Joe Bauman's 72 Home Runs for Roswell in 1954!

Presenter: Steve Krevisky, Middlesex Community College

Baseball lends itself very well to mathematics and statistics. Using formulas such as batting average, slugging average, on-base average, and other measures, we analyze the amazing performance of Joe Bauman, who blasted 72 home runs

for the Roswell, NM team in 1954. It was truly an amazing season, as he tallied over 200 runs-batted-in! Bauman held the all-time US organized baseball record for most home runs in a season until the early 2000's. This presentation is intended for teachers of statistics, quantitative literacy, or algebra.

Using Interactive Modeling Simulators in Teaching Math and Science
Presenter: Chris Platero, University of New Mexico-Gallup

The use of computer simulation programs in the classroom to demonstrate physical science concepts in math and science is necessary to increase student learning. This session will present several simulation programs used in teaching physics and math from the demonstration of a TI graphing calculator to more interactive Phet Simulators.

SESSION IX

Saturday, 11:00 – 11:50a

Elements of a Successful Online Mathematics Discussion Board
Presenter: Kitty Berver, El Paso Community College

The online discussion has been the traditional backbone of the online class, but can it work in teaching mathematics? Learn why this teacher believes the answer is a definite yes, and her experience with what has worked and what hasn't worked!

Saturday, 11:00 – 11:25a

Lessons Learned Piloting an Individually-Paced Model in Developmental Mathematics
Presenter: Emily Miller, University of New Mexico-Valencia

A pilot in Pre-Algebra and Introductory Algebra has been running for two semesters now. The course is loosely comparable to NCAT's Emporium model. A summary of the results and the lessons learned from the pilot will be given. An outline of our plan to alter and expand the program to all courses in Pre-Algebra, Introductory Algebra, and Intermediate Algebra will be presented. Audience participation (especially brainstorming ideas to help face ongoing challenges) will be highly encouraged.

Saturday, 11:00 – 11:50a

MAA Southwestern Section Business Meeting

Join us for our annual business meeting to find out the latest MAA-SW news & information!