



NEMATYC CONFERENCE AT QUINSIGAMOND COMMUNITY COLLEGE

March 27 - 28, 2015

Register at www.nematyc2015.eventbrite.com



Keynote Speaker



Soha Hassoun - Tufts University

Computational Modeling and Design for Engineering

Computers are cool, but how do you use them in Engineering? Are they super calculators that crunch lots of numbers? This talk offers a glimpse of how computational methods are used in Engineering. How do you build a computational model? How do you make sure it is right? And if you had a model, how do you make design decisions that result in the best Engineering products? Modeling and optimization of caterpillars and soft robots will be used as an example.

Agenda

Friday	
2:30-4:30	Registration
3:15	Sessions Begin
6:00-9:00	Dinner and viewing at the Worcester Historical Museum
Saturday	
8:00-12:00	Registration and Continental Breakfast until 10:00
8:30	Welcome
9:00	Sessions Begin
12:15	Lunch and speaker
2:00	Sessions Continue
4:00	Business meeting

Speakers & Sessions

A: Multiple sudden infant death: Coincidence or beyond coincidence in Sally Clark's case

Eiki Satake - Emerson College

On hearing that a family has suffered two, three, or even four sudden infant deaths (SID), what should our initial reaction be? Should we view multiple deaths with a great deal more suspicion than an occurrence of just one sudden death in a family? Slightly more than a decade ago, a young couple in England suffered one of the most devastating losses imaginable – their first baby Christopher died in his sleep, aged only 11 weeks, and their second baby Harry also died in his sleep, aged 8 weeks. Four weeks later after Harry's death the couple were arrested, and eventually the mother, Sally Clark, was charged with murdering both children. She was convicted and given a life sentence by the Royal Supreme Court. This research presentation illustrates how the Bayes Rule saved Sally Clark's life and proved her legally innocent.

B: Developing Questions for Developmental Mathematics

Natalya Vinogradova - Plymouth State University

During this session, participants will examine the difference between closed and open-ended questions. Every participant will have an opportunity to create a few questions leading to interesting mathematical investigations that will keep their students engaged.

C: Statistics and Ecology

Barry Woods – Unity College

Excel will be used to demonstrate the use of statistics in Ecology. From the Z-test for one-proportion (25% green peas according to Mendell), to the chi-square goodness of fit test for the 9:3:3:1 ratio for "Fast Plants," to the Z-test for the Holgate statistic (spatial distribution), to the use of a 2-sample t-test used to compare Shannon-Wiener diversity indices, the use of statistics is of paramount importance in the study of Ecology.

D: Hands-on with Khan Academy's New Algebra Basics Mission for Placement and Stem

Tim O'Connor – New England Board of Higher Education

Khan Academy's Universal Dashboard gives students and instructors real-time access to targeted math Missions, immediate feedback, Coach reports, and Mastery Challenges to identify learning gaps and confirm student understanding of Mission related skills.

E: Find your STEM in the NFL quarterback rating system!

Steve Krevisky – Middlesex(CT) Community College

The National Football League (NFL) uses a multivariable formula for rating its Quarterbacks (QB's), both by the season, and by career. How does the Patriots' QB, Tom Brady, stack up, via this system? How can this model be improved? Teachers of Algebra, Statistics and Quantitative Literacy will find this useful. Bring your calculators!

F: Tired of hearing your students say "When will I ever use this?"

Denise Mrowka – Holyoke Community College

In this session, I will share with you some of my favorite science discovery activities that reinforce developmental math skills. These activities are also appropriate for math classes. A few of these activities involve basic Excel skills, so this session is taught in a computer classroom. No previous knowledge of Excel is required.

G: Half Measures Toward the Flipped Math Classroom

Andrew Perry - Springfield College and Asnuntuck Community College

In this presenter's opinion, the flipped classroom is so logical and compelling an idea that we must all move somewhere in that general direction eventually. On the other hand, the transition may be slow and tricky for faculty as well as for students and we have to proceed cautiously. I will discuss some intermediate measures I've personally taken toward a flipped classroom and encourage audience members to share their own experiences in the session. In addition, I invite interested parties to email me operryand@gmail.com in advance of the session with any comments, suggestions, or contributions.

H: Math Remediation Redesign: Flipping the College Classroom with In-Class Tutoring

Lynne DeSantis – Mount Washington College

This flipped-classroom course redesign model for

the freshman-level college mathematics course uses a vendor's adaptive learning technology and collaborative peer group learning activities with peer-to-peer in-class tutoring and instructor in-class tutoring for students who need mathematics remediation. The course redesign model and data collection results that measure course effectiveness will be presented using assessments based on the course outcomes.

I: Mathematics and Planet Earth

Catherine Roberts – College of the Holy Cross

Mathematics of Planet Earth (www.mpe2013.org) is a world-wide initiative to explore how the tools of mathematics can help us understand our planet, specifically urgent issues such as climate change, how to manage our fish and forest resources, etc. This talk will introduce you to the steps of mathematical modeling and will explore how mathematics helped the Grand Canyon National Park best schedule white-water rafting trips. Come see gorgeous photos, a short video, and learn about the power of mathematics to make the world a better place!

J: Predicting Ebola

Catherine Roberts – College of the Holy Cross

The 2014 outbreak of Ebola in West Africa relied on mathematical models to predict how many cases would emerge so that governments and health organizations could adequately prepare their response. Using real data from 2014, we will show how to choose a model and use available data to determine the parameters of the model. We will use the model to make predictions as to the future number of cases. The audience will work together

to derive a linear and an exponential model and will discuss the pros and cons of each approach. This material would be appropriate for a classroom that has discussed linear equations.

K: Online Math Software: Beneficial or Not?

Magdalena Luca – Mass College of Pharmacy and Health Science

In this presentation I will examine the benefits and the drawbacks associated with the adoption of online math software systems. For many years, our department had discussed the adoption of such software. The need for an online system was due to class size and lack of graders. In the Fall of 2013, we adopted a learning system for almost all of our math courses. I will describe my experience teaching Calculus I using this online system by showing specific examples of the benefits and issues I have encountered in Spring 2014. In addition, I will discuss my involvement in piloting a different online system for teaching Precalculus this semester. I invite all participants to engage in a discussion about their experience using online math software and its implications in learning mathematics.

L: Quinsigamond Community College's Emporium Evolution

Philomena D'Alessandro – Quinsigamond Community College

The QCC developmental math emporium sections transform developmental math education in a way that personalizes the experience for each individual student and promotes acceleration through the developmental math sequence. Utilizing computer-based learning, the emporium model is a student-centered, flexible learning environment that is supported in real-time by individualized instruction,

interaction and engagement in a computerized math classroom. The students have the opportunity to complete multiple developmental courses in a single semester and have their intermediate progress saved for the next semester. Many of the key design features that have been implemented within the past three years will be discussed.

N: An Accelerated Pathway for Non-STEM Students

Brian Mercer – Parkland College

At state and national levels, pressure and excitement are building to offer alternative pathways through developmental math. Attendees will learn about a Math Literacy course inspired by AMATYC's New Life initiative that allows students who place at the beginning algebra level to reach college level math in one semester. While this course was designed for the students heading to liberal arts math or statistics, one goal is to inspire students to pursue a STEM-related field. Schools implementing this new course have seen benefits for both their STEM and their non-STEM students.

O: What's Your Base?

Elizabeth Reith – Great Bay Community College

Working with Number Bases is often intimidating for both student and teacher. These activities will give teachers another approach to the concepts involved. Number Base activities will go from the concrete to the abstract by using manipulatives to show converting from base 10 to another base and vice versa. Participants will then move to pencil and paper. We will also cover operations with number bases as time allows.

(Continued on page 10)

Conference Program

Friday, March 27

2:30-4:30	Registration, Exhibits – <i>Harrington Learning Center Lobby</i>				
	210 Surprenant	135 Surprenant	133 Surprenant	Hands-On	Math in Other Disciplines
				120 Surprenant	212 Surprenant
3:15-4:00	The Flipped Classroom Approach Brechlin P	Multiple Sudden Infant Death: Coincidence or Beyond Coincidence in Sally Clark's Case Satake A	Long STEM Roads for Life Miller X	Computer Algebra Systems: How I Use Them to Teach Low-Achieving Algebra Students Reardon BB	Robotics in the STEM Curriculum Lauer Y
4:15-5:00	Find Your STEM in the NFL Quarterback Rating System Krevisky E		Developing Questions for Developmental Mathematics Vinogradova B		
6:00-9:00	Dinner, Welcome, and Viewing – <i>Worcester Historical Museum - Sponsored by Pearson</i> <ul style="list-style-type: none"> • Welcome by Dr. Gail Carberry, President of Quinsigamond Community College. • Park in the museum parking lot or in the Elm Pearl Parking Garage a half block from the museum. • Allow about 20 min. to drive there. • Museum: 30 Elm St., Worcester, MA 01609 • Pearl Elm Garage: 20 Pearl St., Worcester, MA 01608 (\$1 after 5 pm) • Maps are available at the Registration Table. 				

Conference Program

Saturday, March 28

8:00-12:00	Registration, Exhibits, and Continental Breakfast until 10 am – <i>Harrington Learning Center Lobby and Room 109</i>							
8:30-8:50	Welcome – <i>Surprenant Auditorium</i>							
	132 Surprenant	135 Surprenant	133 Surprenant	Hands-On 120 Surprenant	Math in Other Disciplines 119 Surprenant	Computer Room 123 Surprenant	Vendor Presentations 131 Surprenant	
9:00-9:45	Half Measures Toward the Flipped Math Class Perry G	The “After Math” – How Well Are We Preparing Our STEM Transfer and Career Students? Das S	Mathematics and Planet Earth Roberts I	The Midpoint Polygon Problem Reardon CC	“Does This Course Have a Lot of Math?” Soracco DD	GeoGebra Tips and Tricks Manthey W	Meeting Students Where They Are with Aleks McGraw-Hill MM	
10:00-10:45	Math Remediation Design – Flipping the Classroom With In-Class Tutoring DeSantis H	STEM Learning Communities: The Entente Cordiale among the STEM Disciplines Levin V	Statistics and Ecology Woods C	Transformational Geometry Comes Alive- Immediate Interactive Investigations Reardon AA	Math, Science, and the Automobile Morin U		Mathematics: Journey from Basic Mathematics through Intermediate Algebra Cengage KK	
11:00-11:45	Math Fusion, a Co-Requisite Model Sullivan II	STEM (Students Transformative Engagement in Mathematics): Assignment Redesign Das T			Sweet Little Lies: Boosting Quantitative Literacy in Introductory Sociology Benway HH	Tired of Hearing Your Students Say “When will I use this?” Mrowka F	Getting the Most out Of MyMathLab Pearson LL	
11:45-12:15	Dedicated Exhibit Time – <i>Harrington Learning Center Lobby</i>							
12:15-1:45	Lunch, Speaker, Awards, AMATYC Drawing, Raffle Drawings – <i>Harrington Learning Center Room 109</i> Keynote Speech: “Computational Modeling and Design for Engineering”, Professor Soha Hassoun, Tufts University							
2:00-2:45	Online Math Software: Beneficial or Not? Luca K	QCC’s Emporium Evolution D’Alessandro L	An Accelerated Pathway for Non-STEM Students Mercer N	Computer Room 119 Surprenant	Hands-On 120 Surprenant	Math in Other Disciplines 131 Surprenant	Computer Room 123 Surprenant	
3:00-3:45				High School GPA in College Math Placement Woolhouse R	Mastery Learning – A Higher Standard Takvorian GG	Predicting Ebola Roberts J	Use of OER’s and a Personal Website to Help Reduce Student Costs Simao Q	Use of Microsoft Mix to Minimize Lost Classes Schmohl FF
4:00-5:00	Business Meeting, Elections, and Door Prizes – <i>Surprenant Auditorium</i>							

Speakers & Sessions (Cont.)

P: The Flipped Classroom Approach

Donald Brechlin – Southern Connecticut State University

The technology to foster change in the way we conduct business in our classes is here. Give students a chance to digest direct instruction on their own time and speed and leave the classroom time for problem solving, small & large group discussions, etc. There are so many options and variations at your disposal. If you find yourself frustrated by the same results semester after semester, perhaps it is time to try something different. Nothing changes if nothing changes.

Q: Use of OER's and a Personal Website to help reduce student costs

Ann-Marie Simao – Springfield Technical Community College

Textbook costs are extremely high for all students. Open Education Resources(OER's) are a way to help students reduce textbook costs. You can create a textbook with only the information that your students need and update the text as often as you need to. You can also use a personal website to supplement information for students. Personal websites can contain a link to the online and PDF versions of the text, helpful worksheets with answers, helpful websites, videos in English and Spanish, class syllabus and test dates.

R: High School GPA in College Math Placement

Maureen Woolhouse – Quinsigamond Community College

In the late fall of 2013, the Office of the Commissioner of Education suggested that both four-year and community colleges attempt to experiment with the use of recent high school graduate GPA's as a mechanism for placement into college level math classes. Many campuses have attempted to do this, using the GPA in differing ways. This panel led discussion will look at some of the mechanisms used by several campuses and potentially examine some preliminary data from these experiments.

S: The "After Math" : How well are we preparing our transfer students and getting others ready for a STEM career?

Mita Das – Middlesex(MA) Community College

How are we doing in "higher level" math courses? Teaching Calculus and Differential Equation courses for STEM majors in a Community College is challenging due to the uneven "Calculus readiness" of students. How do we handle this diversity of backgrounds and readiness?

Is Calculus a barrier for college completion in two years?

After successful completion of our Calculus and Differential Equations courses, are our students mathematically at the same level with their counterparts coming from four-year colleges or universities?

T: STEM(Students Transformative Engagement in Mathematics): Assignment Redesign

Mita Das – Middlesex(MA) Community College

In a developmental Math class we all are learners; the teacher and the students alike. Every day teachers learn how to be more effective in the classroom. We experiment with different styles and strategies driven by the question: Are the students indeed acquiring solid mathematical understanding? Effective teaching largely depends on student engagement. Assignment redesign is one of the key ingredients to this recipe. An interesting and appropriate assignment not only engages students, it transforms a passive learner into an active learner. I will share some of my redesigned assignments and look forward to a lively discussion with sharing of ideas.

U: Math, Science, and the Automobile

Donald Morin – Quinsigamond Community College

By means of a PowerPoint and discussion, this presentation will show how math and science are used in Automotive Technology.

V: STEM Learning Communities: The Entente Cordiale among the STEM Disciplines

Aaron Levin-Holyoke Community College

There is a significant body of research supporting the use of Learning Communities to boost both student learning and academic achievement. Learning

Communities provide inquiry-based and innovative educational strategies which work to improve student retention, motivation, and success. Why then do we see little or no strictly STEM-centered Learning Communities at our community colleges? As STEM fields develop and STEM-careers become more plentiful, the need for students to demonstrate increased skill in areas such as scientific reasoning, comprehension, and quantitative/analytical reasoning(to name just a few) is vital to the future of an educated society.

W: GeoGebra Tips and Tricks

Joseph Manthey – University of Saint Joseph

GeoGebra is an extremely versatile free dynamic mathematics software package which combines elements of geometry software, computer algebra systems and spreadsheets. In this presentation we will explore some tips and tricks for working with GeoGebra including dynamic text, color systems, working with images, spreadsheets, fine tuning animations, the sequence command, the locus command, exporting to GeoGebraTube and more. After attending this session, participants will be better able to use GeoGebra in their classes.

X: Long STEM Roads for Life

Andrew Miller – Berkshire Community College

Perspectives on STEM Education: Science, Technology, Engineering and Mathematics professionals are in demand and the supply is wanting. Government and Industry concerns have motivated STEM activities and funding for grades K - 16 to increase the supply. What shape are these activities taking? What are the roles played by colleges, high schools, and elementary schools in the preparation for STEM careers?

Y: Robotics in the STEM Curriculum

BJ Lauer-Quinsigamond Community College

This presentation will explore STEM curriculum using robotics at the K-12 and college level. A focus will be placed on the variety of technical and 21st Century skills learned by students. Potential in-demand careers will be highlighted.

AA: Transformational Geometry Comes Alive-Immediate Interactive Investigations

Tom Reardon-Youngstown State University

I have been working with a computer programmer for over a year to create colorful, interactive, and intuitive activities that will assist middle and high school students (and their teachers) to investigate and learn about translations, reflections, rotations and dilations. You will be among the first mathematics educators to get hands-on experience with these on supplied iPads. Your feedback will prove valuable to us—these activities will soon be made available to the public for free. Our goal is that users will be actively investigating the geometry within 15 seconds of starting the technology—iPads, handhelds, or software.

BB: Computer Algebra Systems-How I Use Them to Teach Low-Achieving Students

Tom Reardon-Youngstown State University

Find out what CAS is and how to use it to help your students discover and learn algebra, geometry, and beyond. See why CAS should be called Dynamic Algebra and how it encourages students to persevere

when doing algebra. Obtain several great teaching and learning ideas—hands-on! All materials will be made available to participants. I am organizing an international CAS conference in Cleveland this July and this can serve as an introduction to what you will see and do at the conference.

CC: The Midpoint Polygon Problem

Tom Reardon-Youngstown State University

Discover how I used dynamic geometry to discover interesting patterns among ratios of perimeters and areas of what I call midpoint polygons. Some very surprising results that include some interesting mathematical modeling. I will supply the dynamic geometry on iPads for you to investigate and discover the patterns.

DD: “Does this course have a lot of Math?”

Anita Soracco-Quinsigamond Community College

Teaching in the sciences can be a challenge, when having to include mathematical concepts, or math modeling. Concepts such as human population growth, the Ozone Layer, and climate involve a use of mathematics and quantitative reasoning. This presentation will include a discussion of the challenges and rewards of incorporating math into the science curriculum as well as explore some activities that ease the fear of quantitative comprehension.

EE: Mathematics AND the Humanities, Arts OR Sciences: Opposed or Complementary Modes of Thinking?

Mark Bates-Quinsigamond Community College

As educators at all levels hardly need reminding, STEM has become the educational buzzword of the age. It has not gone unremarked by those who teach in the humanities that this all-pervasive acronym has no place for the “H” or an “A” (that is, for the “Arts”). An inevitable part of the debates that rage around the future of education—and not least in regard to STEM education—is the implicit assumption that mathematics (and the sciences, theoretical or applied, that depend upon mathematics), and the “humanities” or “arts,” are opposed disciplines, calling upon very different, and largely irreconcilable, methods of approaching, and conceptualizing, the world. That being the case, right now is the ideal time for teachers, from both sides of the divide, to consider the many ways in which mathematics and the humanities have been—and indeed remain—often complementary, and not inherently oppositional, modes of thinking. One of the ways to begin to think about this is to remind ourselves of the fact that “mathematical” modes of thought, on the one hand, and “philosophical” and “poetic” modes of thought, on the other, have not always been seen as constituting two sides of a rigid and unbridgeable intellectual divide. This presentation (from the humanities side) will briefly review this shared intellectual heritage, and seek to suggest and explore potentially fruitful ways in which the “arts” and “sciences” can re-connect across the curricula divide, in the interests of the who liberal arts spectrum of disciplines, as well as of the vocations that are enriched by those disciplines.

FF: A way to minimize lost snow day cancellations: Microsoft Mix

Pat Schmohl-Quinsigamond Community College

As Dean of Distance Education and Professional Development and working with all faculty with their course shells for all courses, faculty are concerned with the many class cancellations due to snow. Faculty can still lecture and/or hold small group sessions by making videos with Microsoft PowerPoint 2013 and the free add-in Microsoft Mix. This presentation will demonstrate how to easily create a video and then show how to upload it into a Learning Management System and YouTube. Participants will receive a step-by-step handout for creating and uploading a video. If participants choose to stay after session officially ends, they will create a short video. If participants bring a ready-made PowerPoint on a thumb drive, participants can quickly create a video.

GG: Mastery Learning—A Higher Standard

Ken Takvorian-Mount Wachusett Community College

Come and Explore with me! See how I have employed Mastery Learning with guided pacing in my Developmental Math classes for the last 4 years. Classes are held in a computer lab with a professional tutor. My classes are split into three groups: Independent learners, Those Needing a lecture, and Those Testing. Motivated students may finish the course early possibly allowing them to begin and complete a second math course in the same semester. The course has built in Reflection Point questions and a procedure for working on Sills Not Mastered before being allowed to retake a test.

Question?

Are Students Better Served by Mastery Learning?

HH: Sweet Little Lies: Boosting Quantitative Literacy in Introductory Sociology

Gaelan Lee Benway-Quinsigamond Community College

Sociological understanding relies heavily on quantitative methods, especially multivariate analyses that require a relatively sophisticated understanding of statistics. Students in introductory-level Sociology courses are often simultaneously enrolled in developmental Math courses, but this doesn't need to deter them from developing quantitative reasoning skills. Students in my SOC 101 course engage in a semester-long series of small-scale, low-stakes research projects. One of these, "Lies, Damned Lies, and Statistics," is a two-part assignment that requires students to examine a social phenomenon using quantitative representations from popular sources. They build information literacy and critical thinking skills in tandem with an ability to "read" descriptive statistics. The assignment culminates with public speaking skills as students present their interpretations to their fellow students. This session will present the assignment, its evolution and assessment, and some thoughts about signature assignments and threshold concepts in the social sciences.

II: Math Fusion, a Co-requisite Model

Jim Sullivan-Northern Essex Community College

Explore an Accelerated Math Program(AMP) for students who wish to take a college level math course but have a placement exam score below college level. The AMP has students enroll in College Algebra and Trigonometry with co-requisite enrollment in a developmental course, Math Fusion, which provides "just in time" support. The program is intended for students in a STEM or Business major who want to accelerate through their math requirements.

JJ: Calculations for the Biotechnology Lab and Sample graphing exercise

Anna Krzywicka-Racka and Jessica Crowley – Quinsigamond Community College

During this session, participants will view the types of math problems that are common in classes geared toward biology and biotechnology majors. The problems are related to concentrations of common laboratory solutions. A brief exercise relating to different growth patterns and graphing will also be performed.

Vendor Presentations

KK: Mathematics: Journey from Basic Mathematics through Intermediate Algebra

Cengage

In this discussion, we will explore how Aufmann/Lockwood's Mathematics: Journey from Basic Mathematics through Intermediate Algebra presents options for price, access and customization through multiple teaching and learning paths.

LL : Getting the Most out Of MyMathLab

Pearson

Join us today to discuss strategies that will ensure you are getting the best use out of MyMathLab. Learn about newly added interactive features like Learning Catalytics, Personalized Assignments, Integrated Review, Adaptive Learning and Mastery-Based learning tactics and other features that can increase performance of your students in face-to-face, online, or a redesigned math course. Meeting Students

MM: Where They Are with Aleks

McGraw-Hill

STEM rest in Math and Aleks can help! Do all of your students coming into Calc I feel prepared? Have they forgotten any of the algebra needed for Calc I? Aleks can help. See why schools like Penn State, UConn, UMass Boston, Massasoit CC, Manchester CC, and 6 of the largest community colleges are using ALEKS. We need these students to maximize their potential and Aleks is the solution.



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