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www.math.ncsu.edu/undergrad
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Mathematics Newsletter

NEWS FOR THE UNDERGRADUATE
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Meet Seyma Bennett-Shabbir

Seyma Bennett Shabbir was born in Munich, Germany during the first day of the 1973 Oktoberfest parade. Because her father was in the U.S. Army, she traveled quite a bit and had the opportunity to see Spain, Greece, Turkey, France, Switzerland, and Italy. She spent 12 years in Germany and lived in Munich, Stuttgart, Frankfurt, Schwaebisch Gmuend, Fulda, Texas, Georgia, Kansas, and New Jersey. She still loves to travel and will see Thailand and Singapore this May.

She came to North Carolina in 1991. Like many other students, she came to NCSU not sure of what she wanted to major in. Most of her classes dealt with business, computers, and Spanish. During her undergraduate study, she was a DJ for WKNC (host for World Café and Rangeela Sangeet), as well as a member of Alpha Kappa Psi (AKΨ - Business Fraternity), the Turkish Student Association (TSA) and the International Activities Council (IAC). In 1995, she started working for the math dept when her MA 121 teacher Wendy Coloumbe convinced her to work as a student computer consultant to help others with an application called Derive. In 1997, she graduated with a B.S. in Business Management (concentration in Human resources) and a B.A. in Spanish.

Seyma always loved working with computers. She remembers her first Tandy XL1000, working as a high school summer hire for the Army doing data entry, creating her first game in Basic, the first time she surfed the web using Mosaic and the first webpage she created. She now works as a "Teaching Technician" and Webmaster for the Math Department. She helps others with homepages using Dreamweaver, HTML code, or other editors. She manages the multimedia center and helps with Webassign, Wolfware, general computer issues, scanning documents, etc.

In her spare time, she loves to cook, go white water rafting in the Upper Gauley, play with her 2 cats and 3 parrots, watch horror movies, play *Age of Mythology* with her husband, or eat at her favorite restaurants. (Consultant for acclaimed culinary establishments worldwide.)

Advanced Mathematics Courses

These classes may be used as Advanced Math electives.

Summer 2006

MA 401 – Applied Differential Equations II
MA 421 – Introductions to Probability
MA 501 – Advanced Math for Engineers and Scientist I
MA 502 – Advanced Math for Engineers and Scientists II
MA 513 – Introduction to Complex Variables

Fall 2006

MA 401 – Applied Differential Equations II
MA 402 – Computational Mathematics
MA 408 – Foundations of Euclidean Geometry
MA 412 – Long-Term Actuarial Models
MA 421 – Introduction to Probability
MA 426 – Mathematical Analysis II
MA 427 – Numerical Analysis I
MA 430 – Mathematical Models in the Physical Sciences
MA 437 – Applications of Algebra
MA 444H – Problem Solving Strategies for Competitions
MA 493B – Game Theory
MA 501 – Adv. Math for Engineers and Scientists I
MA 513 – Introduction to Complex Variables
MA 531 – Dynamic Systems and Multivariable Control I
MA 532 – Ordinary Differential Equations I
MA 534 – Introduction to Partial Differential Equations
MA 535 – Stab/Time Optimal Cont. of Hered.Systems
MA 565 – Graph Theory
MA 573 – Math & Exper. Modeling of Phys. Processes I
MA 591M – Multivariable Calculus
MA 591F – Fractals and Complex Dynamics

Question and Answer:

Q: Why do truncated Maclaurin series fit the original functions so well?

A: Because they are "Taylor" made.

Congratulations

Summer and Fall 2005 Graduates

Applied Mathematics

*Mr. Rubin Chen
Mr. Brandon R. Clark
Mr. Anthony R. Combs
Mr. Christopher Davis
Mr. Dwight T. Davis
Mr. Jason B. Earl
Mr. Richard S. Fitzgerald
Mr. Keven J. Kunz
Ms. Dawn A. Montgomery
Mr. Jay M. Pearson
Mr. John L. Sullivan
Ms. Laura B. Venning*

Mathematics

*Ms. Mariya Y. Bessonov
Mr. John J. Chester, Jr.
Mr. Ryan A. Costanzo
Ms. Lynn M. Harris
Ms. Christina M. Hewitt
Ms. Jennifer L. Kropff
Ms. Nancy M. Marchant
Mr. Francis B. Navin
Mr. Adam A. Schuett
Mr. Brandon L. Tyndall*

Congratulations to Marilyn McCollum who won the "Award for Outstanding Service in Support for Teaching and Learning" for 2005. This is a highly prestigious award and it is the first time that someone in the Math Department has won.

Honors Program

Justin Fowler, Eric Lownes, William Myers and Travis Tomlinson are currently participating in the Budapest Semesters in Mathematics. Students interested in doing programs such as the Budapest Semesters or Math in Moscow or the Mathematics Advanced Study Semester at Penn State should contact Dr. Paur (see contact info below) or check out the Study Abroad link at <http://www.math.ncsu.edu/honors>. Several students are currently in the process of applying to REU's (Research Experiences for Undergraduates). Information on REU's is available on the Research link at <http://www.math.ncsu.edu/honors>.

Research presentations were given last week by Eamonn Tweedy, who discussed his REU work from last summer, "Heart Rate Regulation During the Postural Change from Sitting to Standing", Will Davis, who also talked about his REU work at Cornell last summer, "A Negligently Brief Introduction to Combinatorial Group Theory"; and Meghan McIntyre, who presented her work with Michael Shearer "A Lens-Shaped Particle Segregation Zone in Avalanches." Several other students will be giving research presentations toward the end of this semester (dates and times to be announced).

New students joining the Math Honors Program last semester include: Albert Blackmon, Jennifer Carter, Morgan Early, June Kim, Daniel Nusz and Ivan Saldarriaga. Luke Bilbro, Will Davis, Ellie Grano, Eric Kalendra, Brandyn Lee, Maggie Linak, Ben Perryman, Daniel Sikes, Paul Smith, Eamonn Tweedy, Don Warren and David Wilson will be graduating in May and Steven Major will graduate in the summer.

Thirty-six students are currently participating in the Math Honors Program and invitations to join the program will be extended sometime during pre-registration. Students interested in more information about the program should contact Dr. Paur, HA 202, 515-2598, sopaur@math.ncsu.edu or check out the honors program web site: <http://www.math.ncsu.edu/honors>

Congratulations to Lynn M. Harris on winning the PAMS Leadership Award and to John J. Chester, Jr. for being a nominee for the PAMS Academic Excellence Award.

Course Highlights

MA797: Introduction to Wavelets

Instructor: D. Labate

Wavelet theory stands at the crossroad of harmonic analysis, signal processing and scientific computing. Its goal is to provide a coherent set of mathematical methods that are adapted to the study of a variety of nonstationary signals and are also suitable for efficient algorithmic implementation. The past decade has witnessed an explosion of research on wavelets, including thousands of papers and a great number of successful applications. These applications include, naming a few, the new FBI fingerprint database and JPEG2000, the new standard for image compression (replacing the old JPEG). This will provide an introduction to the theory of wavelets and its applications in mathematics and signal processing. Additional information is available at <http://www.math.ncsu.edu/~dlabate/MA797.html>.

MA 437: Applications of Algebra

Instructor: Michael F. Singer

What allows CD's to play even when scratched? What lets you send your bankcard number securely over the web? How can you design efficient experiments to give meaningful statistical results? How can we decide if an industrial robot can perform a desired manufacturing job? What are some of the principal mathematical tools of computer aided geometric design? What allows us to enumerate isomers in organic chemistry? The answers to these questions all involve applications of abstract algebra - a tool that, precisely because of its abstract nature and power, has the versatility to be applied to so many fields. In this course we will use the algebra you learned in MA 403/407 and MA 405 to answer the above questions. We will look at mathematical topics in error correcting codes, cryptography, algorithmic manipulation of polynomials (Groebner bases), block designs, and Polya counting theory. We will use the book "Applications of Abstract Algebra with MAPLE" by Klima, Sigmon and Stitzinger as well as new notes produced by the instructor. The grade will be given on the basis of homework and a project. This course will also be offered as an honors option. Contact the instructor, Michael Singer, singer@math.ncsu.edu, if you have any questions.

MA 591F: Fractals and Complex Dynamics

Instructor: John Franke

This three hour class looks at the mathematics behind, and computer programming of fractals. The relationship between these intricate sets and complex dynamical systems is presented. The major prerequisite is MA 425. No programming experience is needed. Contact Dr. Franke so that a suitable time can be found for everyone wanting to take this class.

MA 430: Mathematical Models in the Physical Sciences.

Instructor: James Cook

jscook3@unity.ncsu.edu

Prereq: MA 242; and MA 405.

This course should be of interest to any undergraduate who is eager to learn about differential forms. We will use differential forms to rephrase the mathematics of MA 242 in a neat unified language. The gradient, curl and divergence will be unified into the exterior derivative. The generalized Stoke's theorem will be applied to reproduce the Fundamental Theorem Calculus, Stoke's, and Greene's Theorems. As our central example, we will explore how Maxwell's equations can be written in the language of differential forms. Lastly, we will define geometry on a vector space. In particular, Minkowski space will be seen to be the geometry, which is consistent with Maxwell's equations. No previous knowledge of physics is assumed and all mathematics beyond MA 242 and MA 405 will be developed during the course. I will be teaching this course under Dr. Fulp's supervision.

MA 493B: Game Theory

Instructor: S. Schechter

Prereq: MA 231 or MA 242

Game theory is not about how to play games; it's about any situation that involves conflict or cooperation. Since the work of John Nash that was shown in the film "A Beautiful Mind," game theory has emerged as a basic language for the social, behavioral, and economic sciences, and even as a way to look at literature and morality. Originally the idea was to find the best strategies for rational opponents; today the emphasis is more on the ability of good strategies to spread by virtue of their success. Hence game theory is now used to understand animal behavior and evolution. We'll use the text "Game Theory Evolving" by Herbert Gintis, which is mostly a collection of great problems. Their names give the flavor: "The Landlord and the Eviction Notice," "The Samaritan's Dilemma," "The Rotten Kid Theorem," "Battle of the Sexes," "Real Men Don't Eat Quiche," "Evolution of Trust and Honesty." In addition, notes by the instructor will be available on the web. This course can be used to satisfy the mathematical modeling requirement for an applied mathematics degree; there will also be an optional paper for students who want to satisfy the major paper requirement.

Answer for Fun With Math: 310



News For The Undergraduate

Todd Fuller High School Math Competition

Congratulations! The Todd Fuller Wake County High School Math Competition was held in October 2005. Enloe High School placed 1st among 11 competing high schools. Raleigh Charter High School placed 2nd and Middle Creek High School placed 3rd.

Undergraduate Posters at the 2005 SACNAS Conference

The Undergraduate Student posters in Mathematics were present on Saturday, October 2005. Charles R. Rogers, a senior, represented North Carolina State University by doing a poster on "The Effect of Alcohol on Neuron Firing".

SUM CLUB CALENDAR

We're on the Web!

See us at:

www.math.ncsu.edu/undergrad

Spring 2006

MARCH

25th SUM GRE Practice - Kaplan Fundraiser {9:30am in HA 201}

28th General Body Meeting [6:00pm in HA 201]

{Peace Corps Presentation – Brian Roy & Peer Advising Session}

{<http://www.peacecorps.gov/minisite/index.cfm?shell=education>}

31st–1st MAA – SIAM-SEAS Southeastern Meeting [Auburn University, Auburn, AL]; {<http://www.maa.org/sections/schedule.html>}

FUN WITH MATH

Brian Roberts (Baltimore Orioles) had a .308 batting average. He went 5 for 5 in his next game and was then hitting .319. How many at bats did he have (before the 5 for 5 day)? By Dr. J. Griggs answer: pg 3

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