



MSIT'11 Academy
Department of Mathematics
UCA Box 4912
201 Donaghey Avenue
Conway, AR 72035

Dr. Ramesh Garimella, Chair
Department of Mathematics
University of Central Arkansas
Conway, AR 72035

Activities

The MSIT'12 Program will offer enriched activities for 9th, 10th, & 11th grade students in central Arkansas in mathematics and related fields of science. The MSIT'12 Program provides a setting that is conducive to active learning and the exchange of ideas related to theory and practice in the areas of Science, Technology, Engineering, and Mathematics. Our dynamic instructional environment integrates topics related to sciences and mathematics with hands-on activities. See the other side of this brochure for the activities and their descriptions. All sessions will be conducted by UCA professors.

General Information

While some refreshments will be provided, participants should bring their own lunch. Students will have computers available for computations. All activities will be conducted in the Mathematics and Computer Science building and Lewis Science Center of UCA. A map of the university will be included in the registration packet to show the drop-off and pick-up points for students. Applications will be processed in the order received. We encourage students to apply as soon as possible as there is a limitation on the space. Preference will be given to students in central Arkansas.

Contact Information

Complete information about the MSIT'12 Program (such as more detailed description, activities, and application materials) is available on our Website:
www.uca.edu/math/news/

For questions, contact:

Dr. Ramesh Garimella, Chair
Department of Mathematics
University of Central Arkansas
Conway, AR 72035
Phone: (501) 450-3147
Fax: (501) 450-5662
E-mail: rameshg@uca.edu

Program Information

Fee*: \$75 per participant

Dates: July 16–20, 2012

Time: 9:00 am - 4:30 pm

Lunch time: 12:00-2:00 pm
Bring your own lunch

Lunch time activities include:

- Visit to UCA Planetarium
- Visit to UCA STEM Residential College
- Campus Tour
- Group Photo
- Information on Math & Science programs at UCA

Location:

**Math and Computer Science Building
Lewis Science Center
UCA Campus**

Eligibility:

Participant must be a 9th, 10th, or 11th grade student during 2011-12 school year.

Deadline for application:

June 1, 2012

***A limited number of fee waivers are available. For more information please call the number listed in the contact information.**

University of Central Arkansas

MSIT'12

**Mathematics, Science, &
Information Technology
Summer Academy
July 16-20, 2012**

**Funded by the Arkansas Science &
Technology Authority**



**Presented by
Department of Mathematics
&
UCA STEM Institute**

Registration Form

MSIT'12

Join the **MATHEMATICS, SCIENCE, & INFORMATION TECHNOLOGY SUMMER ACADEMY** for mathematically talented students in Summer 2012 (MSIT'12) at the University of Central Arkansas. This one-week program is designed for promising 9th, 10th, and 11th grade students in central Arkansas. The objective of the program is to stimulate and enhance interest in mathematics and its applications to the physical, biological, and computer sciences. Faculty from UCA's College of Natural Sciences and Mathematics will lead investigations that link their areas of specialty with realistic and scientific applications. Participants will conduct experiments, collect and analyze data, develop mathematical models utilizing computers, and use the results to make predictions and solve problems involving cryptology, detecting molecular details, magnetic resonance imaging, and computational revolution.

Cryptology: Coding and decoding Secret Messages

Dr. R. Garimella & Dr. R.B. Lenin
Department of Mathematics

Cryptography is the art of secret communication. It involves transforming a plain message into an unintelligible text so that nobody other than the intended receiver will be able to decipher and comprehend the message. Due to rapid usage of modern communication technologies, security has become a serious concern in terms of tampering with vital messages



that are being transmitted over the Internet or handheld devices. A great deal of modern cryptography depends upon the basic number theory, especially clever manipulations of large integers, and use of software such as *Excel*. In this program, students will be introduced to essentials of number theory, modular and cryptography, including the famous RSA encryption. Students will gain hands-on experience in encrypting and decrypting messages.

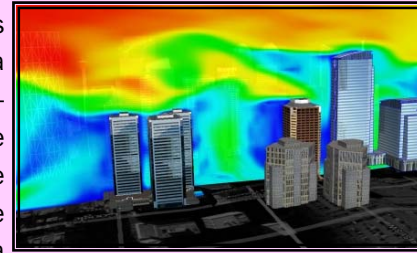
Computer Apps Dr. Mark Smith Department of Computer Science

Application software, commonly referred to as an "app" is computer software designed to help the user perform tasks. This week-long activity focuses on developing apps for the Apple's popular iPod, iPhone, and iPad devices. Participants will develop multimedia apps integrating audio, and core graphics. Application Programming Interfaces using Twitter, YouTube, and Google Maps will also be utilized in building a variety of interesting apps allowing users access to these emerging and ever popular technologies. Participants initially test their apps using Apple's iPhone Simulator, followed by the subsequent app installation on their actual iPod, iPhone or even iPad devices. UCA is a member of Apple's iPhone Developers University, thus allowing all Participants free installation privileges for all apps they develop on all apple devices that they possess. Participants are encouraged to bring their Apple iPhone, iPad, and iPod and install their newly created Apps from the course on them. The activities will be conducted in a hands-on laboratory setting in the Mac Lab located in the Department of Mathematics at UCA.



Wind Simulation Dr. Clarence Burg Department of Mathematics

Have you ever walked past a building and felt a sudden gust of wind? What causes the wind to speed up or slow down in a city? How does a building or a group of buildings impact the wind flow? We will estimate the dimensions of a variety of buildings on the UCA campus and use the computational tools to build computer models of these buildings. Then, we will use other tools to simulate and visualize the wind blowing around and past the buildings. Along the way, we will develop some mathematical equations for the acceleration of wind past and around buildings, and students will create computer models of the buildings using their own design.



MSIT'11 Participants

Student Name _____

Parent/Guardian Name _____

Address _____

City _____

State _____ Zip _____

Home Phone# _____

E-mail _____

Grade in 2011-12 _____

School attended _____

Are you interested in on campus overnight accommodations? (Subject to availability)

Yes No

(For additional information/rates call 501-450-3147)

Name of activity you would like to attend:

(check one box):

Cryptology: Coding and Decoding

Computer Apps

Wind Simulation

