



MathScience Innovation Center
Imagine. Create. Lead.

Professional Development Fall 2007

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Contact Information

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New Name. By 2015 we will transition to the Innovation Economy! The majority of jobs in that economy do not exist today. Nanotech, biotech, robotics and computers will anchor the economy. New fields of mathematics will revolutionize our ability to describe, predict and model events. After two years of study, the MSiC Board charged the Center with leading implementation of programs that will prepare K-12 educators and students for the rapid scientific and technological change that will accompany the transition. Our new name reflects our new emphasis – innovative student and teacher programs!

New Mission. The MSiC will be the innovator, incubator and advocate of 21st Century math and science programs for the Capital Region's K-12 educators and students.

New Programs. This brochure reflects one of our major goals: *to provide opportunities for teachers to learn 21st Century math and science and effective strategies for engaging learners.* So, read carefully! You'll find:

- **Future-oriented courses** as well as **core courses** needed to develop technology skills, expand content knowledge, or become endorsed in various fields.
- **Web-based courses** that will expand learning opportunities. With *Moodle*, you can learn any time any place. With *Elluminate Live!* you can interact with the instructor and class via your computer.
- **25 different courses** designed to meet various learning preferences: face-to-face, web-based or a blended approach.
- It's easy to **register**. Just go to www.msinnovation.info or use the form on this brochure.

C

Calculators & Computers: Blended Web & Face-to-Face Classes

Cabri Jr. – An Introduction and Beyond

This course familiarizes users with the Cabri Jr. APP on the TI 83/TI 84 Graphing Calculators. First, you will learn to use the construct menu, measure objects and angles, use the transformation menu, determine area relationships, and much more. Then, using this powerful program, you will explore transversals and angles, bisectors, distances, special triangles, sides and angles of triangles, trigonometric ratios, centers of triangles, circles and properties of quadrilaterals. Participants will be provided opportunities for real-time discussions and dynamic interactions using two computer-based systems – *Illuminate Live!* and *Moodle*. In the first session, which is face-to-face, you will learn to use these systems, which will be used for the remaining instruction. System requirements are Windows 98/ME/2000/XP or Mac OS 9.2, Mac OS x 10.2.8/10.3.9/10.4 and an Internet connection.

18 points; completers receive course-related gift card of \$200

Gayle Bynum, MSiC

Course begins Wed, Sep 19 and ends Nov 28

Face-to-Face Meeting: Sep 19; 4:15 – 5:45 pm; MSiC Room E-15

Illuminate Live! Meetings: One hour each on Oct 3, 10, 31, Nov 14; Time determined by class.

Casio CFX-9850 Series Graphing Calculator

This course familiarizes users with basic operations on the Casio CFX-9850 Series Graphing Calculators. You will learn to manipulate the on-screen icon-driven menu, which provides easy access to advanced features. You will generate plots and graphs from tables, create a table of values from given functions, and graph and analyze data collected during classroom activities. You will use the communications port for linking to a computer to create interactive handouts. The computer-based system, *Moodle*, will be used for the majority of instruction. You

will learn to use this system at the first meeting. Internet access is required.

18 points; completers receive course-related gift card of \$200

Gayle Bynum, MSiC

Course begins Thu, Sep 20 and ends Dec 6

Face-to-Face Meeting: Sep 20; 4:15 – 5:45 pm; MSiC Room E-15

NEW

It's Elementary! Proven Tools for the K-5 Classroom

Do you want to incorporate technology into your lessons, but don't know where to start? In this class you will get an introduction to some great tools for the elementary classroom such as the National Library of Virtual Manipulatives (eNLVM), PowerPoint, United Streaming and Photo Story. We will share all of our work with each other and you will leave with several great new lessons for your class! Participants will be provided opportunities for real-time discussions and dynamic interactions using *Illuminate Live!* and *Moodle*. In the first session, which is face-to-face, you will learn to use these systems, which will be used for the remaining instruction. System requirements are Windows 98/ME/2000/XP or Mac OS 9.2, Mac OS x 10.2.8/10.3.9/10.4 and an Internet connection.

8 points; completers receive course-related gift card of \$100

Theresa Meade, MSiC

Course begins Thu, Oct 18 and ends November 15

Face-to-Face Meeting: Oct 18; 4:15 – 5:45 pm; MSiC Room E-15

Illuminate Live! Meetings: Oct 25; Nov 1, 8, 15; 4 – 5:30 pm

Introduction to the TI-83 & TI-84 Series Calculators

This course familiarizes users with basic operations on the TI-83 and TI-84 series calculators. Topics will include how to input program commands and transfer programs between calculators, graph and interpret laboratory data, one variable statistics, custom lists and spreadsheets, and downloading sample data from the Internet. The computer-based system, *Moodle*, will be used for the majority of instruction. Your will learn to use this system at the first meeting. Internet access is required.

18 points; completers receive course-related gift card of \$200

Rebecca Pittman, MSiC

Course begins Thu, Sep 20 and ends Dec 6

Face-to-Face Meeting: Sep 20; 4:15 – 5:45 pm; MSiC Room E-15

M

Mathematics: Blended Web & Face-to-Face Classes

A 21st Century Spin on Middle School Mathematics

Are you constantly hearing students say: "When am I ever going to use this?" Many mathematical advances are revolutionizing the math they will study in higher education and in the workplace. In fact, fractal geometry and modeling have been listed among the top ten advances of the 21st Century. Spice up your mathematics curriculum by teaching core SOL concepts through modern mathematics related to geometry, probability and statistics, and number sense. Participants will be provided opportunities for real-time discussions and dynamic interactions using *Illuminate Live!* and *Moodle*. In the first session, which is face-to-face, you will learn to use these systems, which will be used for part of the course delivery. System requirements are Windows 98/ME/2000/XP or Mac OS 9.2, Mac OS x 10.2.8/10.3.9/10.4 and an Internet connection.

8 points; completers receive course-related gift card of \$100

Andy Derer and Arletta Aleshire, MSiC

Course begins Tue, Oct 23 and ends Nov 20 (make-up on Nov 27)

Face-to-Face Meetings: Oct 23, Nov 20 (make-up on Nov 27); 4:30 – 6:30; MSiC Room E-15.

Illuminate Live! Meetings: Oct 30, Nov 6, Nov 13; 4:00 – 5:30 pm

Using IFS Capable Software to Make Connections: Iteration, Fractals & Chaos

Because computer software has revolutionized our ability to iterate, new fields of mathematics have emerged including fractal geometry and Chaos Theory. In the first session, learn how iterative function systems (IFS) can be taught using software ranging from *Capri Jr.* to *Geometers Sketchpad* to *Mathematica*. In the next session, geometry will be emphasized and you will use the IFS to transform geometric objects and create fractals. Then, move to algebra where you will be introduced to the analysis

NEW

NEW

of fractals and current mathematics topics including Chaos Theory. Finally, advanced mathematical topics such as complex numbers and limits and derivatives will be examined. Exploration of the Mandelbrot and Julia sets will provide a connection to fractals. Feigenbaum bifurcation is introduced as a connection among iteration, fractals and chaos. The majority of instruction will be through the computer-based systems, *Illuminate Live!* and *Moodle*. In the first session, which is face-to-face, you will learn to use these systems. System requirements are Windows 98/ME/2000/XP or Mac OS 9.2, Mac OS x 10.2.8/10.3.9/10.4 and an Internet connection.

8 points; completers receive *Mathematica* software

Gregg K. Whisler, MSiC

Course begins Mon, Oct 15 and ends Nov 12

Face-to-Face Meeting: Oct 15, 4:30 – 6:30;
MSiC Room E-15.

Illuminate Live! Meetings: Oct 22, Oct 29;

Nov 5, 12, 19 (make-up);
4:00 – 5:30 pm

Mathematics: Face-to-Face Classes

Calculus: Fall Conference for Teachers of AP, IB and Other Advanced Courses

Let's do it again! Our first conferences for teachers of AP, IB, and other advanced courses were a hit. We excitedly shared challenges, strategies and approaches for teaching Calculus. Join teachers across the consortium as they learn about and share strategies for effective and efficient teaching of Calculus. We plan to see returning participants and to welcome new participants. Come and join the network of Calculus teachers. Continue to dialogue through the web.

5 points

Gayle Bynum, MSiC; Lynn Foshee Reed,

Maggie L. Walker Governor's School; and

Carolyn Williamson, Lee-Davis High School
Mon, Oct 29

9:00 am – 2:00 pm, with lunch provided

MSiC: Room D-9

Discrete Math

This course includes introductory topics in mathematical logic such as symbolism, converse, and contrapositive. An introduction to set theory will include union and intersection. Applications of Boolean Algebra and graph theory will be explored. Participants must have completed pre-calculus and trigonometry. This course can be used to meet requirements for Middle School mathematics, Algebra I Add-On, or Secondary Mathematics endorsements. Participants may

purchase the textbook, *Discrete Mathematics with Applications*, approximate costs of \$150, on the first night of class.

3 Undergraduate credits

Math 211, VCU

Tuition of \$535 to be paid by individual or school division

Dewey Taylor, VCU

Dates: Mon, Sep 10 - Dec 17

4:30 – 7:00 pm

MSiC: Room D-16

NEW Numbers and Operations for 3-5 Teachers

Learn how to enhance your lessons and deepen students' understanding through discovery-based activities. This class will focus on hands-on lessons appropriate for grades 3-5. The topics covered will include primes, composites, squares, multiplication and division. Plan to bring your textbook or curriculum map to see how these ideas can supplement your present lessons.

8 points; completers receive course-related gift card of \$100

Theresa Meade, MSiC

Thu, Sep 20, 27; Oct 4

4:30 – 7:00 pm

MSiC: Room D-9

Statistics Teachers Fall Conference: AP and Advanced Courses

Always looking for ways to improve your students' understanding? Have your own tips to share from your experience? Want to network with others who teach statistics? Finally, a workshop just for you! Join area statistics teachers for this conference featuring Dr. Dan Yates, published author of statistics textbooks. Learn more about our on-line community called "STAR," Statistics Teachers Around Richmond.

5 points

Gregg Whisler, MSiC, and Consortium Teachers

Tue, Nov 13

9:00 am – 2:00 pm, with lunch provided

MSiC: Room D-9



Science: Blended Web & Face-to-Face Classes

NEW Effective Strategies for Teaching Chemical Concepts to Middle or Introductory High School Students

Simplify the math for students by using visual tools that help all students master math concepts from the metric system to stoichiometry. Explore new strategies for teaching the basics of atomic structure and bonding. Review the basics of teaching the periodic table and learn new strategies for helping students decipher this valuable tool. Classroom ready copies of all materials and Internet resources will be provided. Participants will have opportunities for real-time discussions and dynamic interactions using two computer-based systems – *Illuminate Live!* and *Moodle*. In the first session, which is face-to-face, you will learn to use these systems that will be used for the remaining instruction. System requirements are Windows 98/ME/2000/XP or Mac OS 9.2, Mac OS x 10.2.8/10.3.9/10.4 and an Internet connection.

18 points; completers receive course-related gift card of \$200

Rebecca Pittman, MSiC

Course begins Wed, Sep 19 and ends Dec 5

Face-to-Face Meeting: Sep 19; 4:15 – 5:45 pm; MSiC Room E-15

Illuminate Live! Meetings: One hour each on Sep 26; Oct 17, 24; Nov 14; time determined by class.

Geo-Virginia: Creating Virtual Field Trips

Virginia geology is a major part of the Earth Science curriculum yet many students have not traveled outside their immediate area. Engage your students through virtual trips and have them create and post a virtual trip of the geology of their area, school, or other buildings. Participants will learn to access a Google-based map and to use a simple web-based system to build a virtual field trip page. After completing the initial training, you will receive a digital camera with video capabilities and a variety of geologic resources including print and digital maps, books, pamphlets and CD-ROMS.

After completing your own page, your school will receive two additional cameras and sets of geologic materials. All participants must teach earth science at the middle or high school level and commit to having their students make web pages focused on their area. Participants will have opportunities for real-time discussions and dynamic interactions using two computer-based systems – *Illuminate Live!* and *Moodle*. System requirements are Windows 98/ME/2000/XP or Mac OS 9.2, Mac OS x 10.2.8/10.3.9/10.4 and an Internet connection. This course is part of the MSP Grant, *Virginia Earth Science Collaborative*, funded by the Virginia Department of Education. You must register for this course using the application available at www.VirginiaEarthScience.info. Enrollment is limited to 15 statewide, so act fast. Participants who commute more than about 90 minutes receive Friday night lodging and meal.

40 points; digital cameras and geologic materials

John Sylvester and Joyce Watson, MSiC
Web-based asynchronous instruction begins September 17 and ends October 26.

There will be one face-to-face meeting on Sat, Sep 29; 9 am - 4 pm MSiC Room D-16.

Meteorology

Concepts include the Earth's heat budget and global wind patterns, weather vs. climate, radiation, convection, cloud formation, the hydrologic cycle, vertical structure of the atmosphere, orographic effects on weather, severe weather, the influence of life and geological processes on atmospheric composition and temperature through geologic times, and comparison of the atmosphere of Earth, Mars and Venus. The majority of the course will be through the Internet, with participants meeting for three face-to-face sessions on Saturday. Textbook and instructional books are provided. You must register for this course using the registration form at www.VirginiaEarthScience.info. This course is funded through the *Virginia Earth Science Collaborative*, an MSP grant funded through the Virginia Department of Education. Friday night lodging and meal will be provided for those commuting more than about 90 minutes.

3 graduate credits

ENVS 591, VCU

Tuition of \$150 paid by individual or division JoAnn Mulvany, VCU

Course begins Sat, Sep 15 and ends Dec 15.

Face-to-Face meetings: Sep 15, Nov 3 and Dec 15 (these meetings are mandatory);

10:00 am – 4:00 pm; MSiC Room D-16

Science: Face-to-Face Classes

Applying Fractals in Student Labs & Research: Observing Nature with a New Eye

Nature does not exist in perfect patterns and scientists are no longer studying it as if it does. Why measure the height of a corn stalk when more insightful data might come from examining the roots? Unfortunately, conventional methods of data collection are not well suited for less conventional measurements! Fractal geometry offers another way of observing, measuring and modeling nature. In this course, you will use both hands-on and computer-based methods to measure the fractal dimensions of a variety of phenomena from the chemical, biological, earth and environmental sciences. Photography will be used to document patterns and create images for analysis. You will learn how the "random walker model" is used to explain fractal patterns ranging from chemical deposition to DNA. Ideas and techniques for modifying student labs or research projects to incorporate fractal analysis will be explored. Participants will analyze data from an experiment they, or their students, conducted using a fractal dimensioning freeware program.

8 points; completers receive course-related gift card of \$100

Steve Oden, MSiC, and 21st Century Fractal Fellows

Tue, Sep 25; Oct 2, 9, 16, 23 (make-up)

4:30 – 6:30 pm

MSiC: Room E-16

Biology: Fall Conference for Teachers of AP, IB and Other Advanced Courses

Welcome to Year 2 of our AP/IB/Advanced Biology conferences. We will build on last year's foundation to provide more opportunities for peer-interfacing and content enrichment. Share ideas, concerns, resources and classroom experiences and establish an information and support network with your fellow educators. Based upon feedback from last year's participants more time will be allotted for discussing, brainstorming, and sharing strategies for labs, testing, and classroom activities. This is your conference – volunteer to conduct a session or to make a topic-specific presentation. Online methods for interfacing with one another will allow you to maintain dialogues after the conference concludes.

5 points

Steve Oden, MSiC, and Consortium Teachers

Tue, Oct 23

9:00 am – 2:00 pm, with lunch provided

MSiC: Room D-9

Biology and Environmental Science for K-5 Teachers

Observe...classify...experiment! In the process, obtain a deeper understanding of the cellular structure, organs, and life cycles of plants and animals. Participate in hands-on activities as you explore interrelationships, natural resources, adaptations, classification, and the Center's web-based resources. A class that creeps and crawls, and in the end, grows on you!

15 points; completers receive course-related gift card of \$150

Rhonda Hawley, MSiC

Mon, Sep 24; Oct 1, 15, 22, 29;

Nov 5 (make-up)

4:30 – 7:00 pm

MSiC: Room D-9

Challenger Center: Mission to Mars

Join us on a Mission to Mars. Using teamwork, non-traditional forms of communication, technology and an interdisciplinary approach, you will take a voyage to Mars! Teams will work in a spacecraft and in Mars Control to achieve Martian orbit, build and launch a probe to a Martian moon, land on Mars, and later lift-off from Mars to return to Earth. Problem-solving and responsible decision-making are integral components of this space mission. You will be introduced to the Center's web-based lesson plan and activities. Required for 6-12 educators, not previously trained, whose students will receive a lesson in the First Union Challenger Center. Others are welcome to attend.

5 points

Martha Rogers and Bill Rhyne, MSiC

Thu, Sep 20

8:30 am – 3:00 pm, with lunch provided

MSiC: Rooms D-16 and E-11

Chemistry: Fall Conference for AP/IB Chemistry Teachers

Teachers will be introduced to the 22 labs in the AP Chemistry Program as they were presented at the summer Vernier Workshop. Probeware including the new LabQuest will be presented and discussed. There will be new information for teachers and then a chance to interact with others in an open forum. Teachers will also have time to discuss their AP audits and the results of the spring IB testing. Come and join your colleagues.

Mary Frances Hobbs, MSiC, and Consortium Teachers

Fri, Oct 12

Time: 2:00 pm – 5:00 pm

Area School – TBD

NEW

Environmental Science: Fall Conference for Teachers of AP, IB and Other Advanced Courses

Teachers of advanced level courses in environmental science, you now have your own conference! The AP Environmental Science curriculum is distinct from AP Biology in its content, lab requirements and testing format. You'll interact with regional counterparts to share ideas and activities, voice concerns, and explore options for enhancing the educational experience of your students. Designed as a teacher-directed conference, you will have the opportunity to set the day's agenda, volunteer to conduct a session, or make a presentation. Online methods for interfacing will allow you to dialogue and network after the conference concludes.

5 points

Patricia Miller and Steve Oden, MSiC, and Consortium Teachers

Tue, Oct 30

9:00 am – 2:00 pm, with lunch provided

MSiC: Room D-9

Metro Richmond Science Fair

This workshop is designed for secondary science, math and computer science teachers who wish to have their students become involved in the 2008 Metro Richmond Science Fair being held on March 15, 2008. Topics addressed include an overview of the science fair, student entry forms, and how you can prepare students for a successful Fair experience. The following general session is open to all school divisions. In addition, some districts may arrange special sessions for their teachers and will advertise these through their internal communication system.

Martha Vogel, MSiC

Thu, Sep 20

4:30 – 7:00 pm

MSiC: Room D-9

NEW

Our Backyard Waterways: Bringing REAL Science into the Middle School Classroom

Do you know why so many scientists are studying the James River and the Chesapeake Bay? Bring current research into your classroom to motivate students to learn about the science in their own backyards! Get up-to-date information on the state of the James River and the Bay, how far we've come, and where the focus is now. Discover the diversity of SOLs that can be taught, gather resources and lesson plans, and increase your

knowledge base. Topics include: Virginia's watersheds - health, habitat, and human intervention; GIS technology - using real world data; Current concerns about our waterways; and, Ecosystem dynamics.

15 points; completers receive course-related gift card of \$150

Rachel Martin, MSiC

Wed, Oct 3, 10, 17, 24, 31; Nov 7, 14

(make-up)

4:30 – 7:00 pm

MSiC: Room C-9

Physical Science Topics for K-5 Teachers: Electricity and Magnetism

Generate learning in the classroom! Acquire the conceptual understanding needed to enhance your teaching of the concepts of electricity and magnetism included in Virginia's *Standards of Learning*. Observe and experience effective instructional strategies. Participate in hands-on activities. Learn how to access the Center's web-based resources. Receive a notebook of resource materials and your own NSTA *Stop Faking It* text.

8 points; completers receive course-related gift card of \$75

Laura Blackburn, MSiC

Tue, Nov 13, 20, 27

4:30 – 7:00 pm

MSiC: Room D-9

Physical Science Topics for K-5 Teachers: Force, Motion and Energy

Energize your classroom! Acquire conceptual understanding needed to enhance your teaching of the concepts of force, motion and energy included in Virginia's *Standards of Learning*. Observe and experience effective instructional strategies. Participate in hands-on activities. Learn how to access the Center's web-based resources. Receive a notebook of resource materials and your own NSTA *Stop Faking It* text.

8 points; completers receive course-related gift card of \$75

Laura Blackburn, MSiC

Tue, Sep 25; Oct 9, 16

4:00 – 7:00 pm

MSiC: Room D-9

Physical Science Topics for K-5 Teachers: Light

Illuminate learning! Acquire the conceptual understanding needed to enhance your teaching of the concepts of light included in Virginia's *Standards of Learning*. Observe and experience effective instructional strategies. Participate in hands-on activities.

Learn how to access the Center's web-based resources. Receive a notebook of resource materials and your own NSTA *Stop Faking It* text.

5 points; completers receive course-related gift card of \$50

Laura Blackburn, MSiC

Tue, Dec 4, 11

4:30 – 7:00 pm

MSiC: Room D-9

Physical Science Topics for K-5 Teachers: Sound

Resonate excitement! Acquire the conceptual understanding needed to enhance your teaching of the concepts of sounds included in Virginia's *Standards of Learning*. Observe and experience effective instructional strategies. Participate in hands-on activities. Learn how to access the Center's web-based resources. Receive a notebook of resource materials and your own NSTA *Stop Faking It* text.

5 points; completers receive course-related gift card of \$50

Laura Blackburn, MSiC

Tue, Oct 23 & 30

4:30 – 7:00 pm

MSiC: Room D-9

Physics Teachers Fall Conference

Are you curious about new and different approaches to the way you teach physics? Are you seeking solutions to problems shared by others who teach? Do you have solutions to share? Join the community of teachers known as "Richmond Area Physics Teachers" who are networking through this conference and an on-line community. Topics for the conference will include assessment strategies, instructional strategies, and technological tools for teaching physics.

5 points

Betsey Davis, MSiC

Wed, Oct 24

9:00 – 2:00 pm, with lunch provided

MSiC: D-9



General Information

1. Educators from consortium and institutional members are eligible to participate. Other educators may participate on a space-available basis and for applicable fees including tuition, a \$5.00 per contact hour fee for non-college credit courses, and instructional materials and field costs.

2. Complete the application form and return by **September 7, 2007**. You may register online at www.msinnovationcenter.info > Teachers. Also, applications can be returned by interoffice school mail, U.S. mail, or fax. Late applications will be enrolled on a space-available basis.

Please note that you must go to <http://VirginiaEarthScience.info> to secure the application for courses funded through the *Virginia Earth Science Collaborative*.

3. Your registration will be confirmed prior to the opening date by e-mail (preferred), U.S. mail, or phone if the class begins very early. Teachers who are not initially selected will be placed on a waiting list. Tuition and textbook fees are payable at the first class by check. Certificates will be awarded to each participant successfully completing non-college credit courses.

4. Check the web for detailed information on offerings and to access online registration. For more information contact:
Ms. Tawana Gilyard, Operations Assistant, Phone: 804.343.6525, X 221;
Fax: 804.343.6529; E-mail: tgilyard@msinnovationcenter.info

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Registration: Professional Development, Fall 2007

First Name	Initial	Last Name	
School Division			
School		School Phone	
Home Address	City	State	Zip
E-mail			
Phone	Fax	Emergency Phone	
Subjects Taught		Grades Taught	
Program	Professional Development, Fall 2007		
Course Name			
Course Name			
Course Name			
Course Name			