New Edu 6000 Chemistry Course plus Physics for Fall 2001

Thanks to funding from the Missouri Coordinating Board for Higher Education (and to everyone in fall 2000 Edu 6003 Force and Motion who signed a support letter!), Science Outreach can now respond to numerous requests to offer chemistry as part of the Edu 6000 Hands-On Science K-8 series. Karen Wooley, professor of chemistry, will be the lead instructor for the fall ’01 course, Edu 6009 Hands-On Science K-8: Matter and Energy. She will share her work in the exciting new field of nanometer-scale science and technology (involving atom- and molecule-sized manipulations), and how it can be used in K-8 science investigations. Science Outreach will also offer Edu 6001 Hands-On Science K-8: Electricity and Magnetism (physics) for fall ’01.

Hands-on activities designed to help teachers meet National Education and Show-Me standards are key components of all Edu 6000 courses. Both Edu 6000 courses for fall ’01 include free classroom materials related to course content and access to loaner kits. Three graduate credits in education are given for each course. Registration/tuition is $200, which is collected on the first class day. This discounted tuition is made possible through funding from the Howard Hughes Medical Institute Undergraduate Biological Sciences Education Program and Missouri CBHE.

For more information about either fall ’01 Edu 6000 course, call Elaine Alexander, program coordinator, (314) 935-7170, or e-mail elaine@biology.wustl.edu.

Mary Dattilo, sixth grade science teacher at Parkway Northeast Middle School (left), and Susan Petroff, fifth grade teacher at Mason Ridge Elementary School (right), observe life in an ecoglobe in spring 2001 Edu 6004. “The globe adds that little bit of life to your classroom,” says Petroff.

Edu 6009 Matter and Energy

Thursdays, 4:30-7 p.m., August 23-Dec. 6, Life Sciences 118
Karen Wooley, professor of chemistry; Victoria May, Science Outreach director
• Answers questions including “what is chemistry?,” “what is matter?,” and “what is energy?” through hands-on investigations
• Activities include classification, measuring properties and determining states of matter, kitchen chemistry basics, and lessons from the American Chemical Society’s “Chemistry for Kids” series
• Profiles of historical chemists, women in science and career fields
• The new field of nanoscience and how manipulating matter at its most basic level is leading to revolutions in medicine, manufacturing and computer technology

Edu 6001 Electricity and Magnetism

Tuesdays, 4:30-7 p.m., August 28-Dec. 4; Life Sciences 118
Patrick Gibbons, professor of physics; Jack Wiegers, assistant professor of physics; Ann McMahon, instructor of physics and science coordinator, Riverview Gardens School District
(continued on page 2)
(continued from page 1)
• Magnets: what do they attract, how strong are they, what are magnetic poles, compasses, making magnets
• Electricity: what it can do, looking at circuits and light bulbs, conductors and insulators, wiring a lamp, measuring brightness, switches and diodes
• Magnets and motors: electromagnets, building spinning coil motors, how do electric motors work?
• Finally, why electricity works the way it does, foundations for understanding atomic nature, particles comprise matter

Additional course for K-8 teachers:
Math 266 Mathematics for Elementary School Teachers
Tuesdays and Thursdays, 4-5:30 p.m., August 28-Dec. 6, location TBA, cost $750
Gary Jensen, professor of mathematics
• Gain a deeper understanding the mathematical concepts of the K-8 curriculum, with a focus on mathematics content, not methods.
• Analyze the mistakes students frequently make and devise strategies for explaining the concepts in such a way that these mistakes will be avoided.
• For each concept many practical applications will be covered.

Science Outreach Summer-Fall 2001 Course Registration

Please enroll me in the following fall 2001 course(s). I understand the $200 tuition will be collected on the first class day.
☐ Edu 6009 Matter and Energy
☐ Edu 6001 Electricity and Magnetism
☐ Math 266 Mathematics for Elementary School Teachers (tuition $750)

Please enroll me in the following SEPA summer workshop:
☐ Ecology, July 16-19
☐ Animal Behavior (TBA)

Name _____________________________________________________________

Address____________________________________________________________

City _________________________State____________Zip___________________

Home phone ______________________Work phone _______________________ 

E-mail_____________________________________________________________

School_____________________________________Grade___________________

District ____________________________________________________________

Send to: Science Outreach Workshop Registration, Washington University, One Brookings Drive, Department of Biology-CB 1137, St. Louis, MO 63130

Science Outreach at Washington University is interested in letting K-12 teachers know about all the wonderful science education opportunities available at WU and in the St. Louis area. As always, questions, comments, ideas and contributions are welcome.

Science Outreach publishes this newsletter three times a year, and mails it free of charge to interested individuals. Contact Amy O’Brien, administrative coordinator, or visit our website if you would like to join our mailing list or update your address information.

Website
www.nslc.wustl.edu/science_outreach/index.html

Victoria L. May, director
may@biology.wustl.edu
(314) 935-6846, ext. 1

Sarah Elgin, chairman of WU biology outreach committee
selgin@biology.wustl.edu

David Kirk, professor of biology/PI for SEPA grant
kirk@biology.wustl.edu

Elaine Alexander, program coordinator
elaine@biology.wustl.edu
(314) 935-7170

Gary Corbin, Modern Genetics program coordinator
corbin@biology.wustl.edu
(314) 935-8138, ext. 1

Mark Kalk, program coordinator
kalk@biology.wustl.edu
(314) 935-8138, ext. 2

Amy O’Brien, administrative coordinator
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(314) 935-6846, ext. 2

Dana Benedickus, grants coordinator/newsletter editor
dana@biology2.wustl.edu
(314) 935-4229
SEPA partnership program: Two summer workshops explore ecology and animal behavior for teachers of grades 5-8

Science Outreach’s partnership program to connect 5-8 students with resources at the Saint Louis Zoo, the St. Louis Science Center and the Missouri Botanical Gardens is underway. Teams of 5-8 teachers, WU faculty, Science Outreach staff, and education staff from the Zoo, Science Center and Garden have been hard at work this spring to develop curriculum in three subject areas. The curriculum is designed to combine standards-based content with the excitement of visiting the informal science institutions. The groups and their members (in addition to Victoria May, Science Outreach director, and David Kirk, professor of biology) are:

Animal behavior team
Terrilyn Clardy, Sumner High School; Janet Crews, Wydown Middle School; Carol Stephenson, Saint Louis Zoo; Stan Braude, WU biology

Ecology team
Maline Cole, Northwest Middle School; Michele Dodds, Pattonville Heights Middle School; Celeste Prussia, Missouri Botanical Garden; Susan Flowers, Washington University Tyson Research Center; Elaine Alexander, WU Science Outreach

Sensory perception team
Gary Schoenberger, Gotsch Elementary School; Brenda Tyndal, Nottingham Middle School; Carey Tisdal, Carol Valenta and Fred Vasquez, St. Louis Science Center; Mark Kalk, WU Science Outreach

Summer workshops are planned for the animal behavior and ecology units. A workshop on the sensory perception materials is tentatively scheduled for October. Since the focus of this unit is health science, please let your health science colleagues know about this upcoming opportunity.

Funding for this project is provided by a Science Education Partnership Award from the National Institutes of Health.

Ecology workshop
July 16-19, 9 a.m.-3 p.m., Tyson Research Center and Litzinger Ecology Center
• Receive classroom laboratory and inquiry activities that explore the concepts of populations and communities.
• Participants should plan on field testing the curriculum using free materials from the workshop during the 2001-02 school year.
• Teachers and their classes will receive a free transportation-paid field trip to Tyson or Litzinger as part of the field testing.
• To register, please return the form on page 2. For more information, call Victoria May, Science Outreach director, (314) 935-6846, ext. 1, or may@biology.wustl.edu.

Animal behavior workshop
This workshop will be held at the Saint Louis Zoo, Forest Park, for two days this summer. If you are interested in participating, please call Victoria May, Science Outreach director, (314) 935-6846, ext. 1, or e-mail may@biology.wustl.edu.
• Receive classroom inquiry activities that explore interactions within animal populations and lessons to develop skills for systematically monitoring and reporting behavior using ethograms.
• Participants should plan on field testing the curriculum using free materials from the workshop during the 2001-02 school year.
• Teachers and their classes will receive a free transportation-paid field trip to the Saint Louis Zoo as part of the field testing.
Help Science Outreach design new projects and improve current ones

Science Outreach is seeking interested individuals for two focus groups this spring to critique current programs and suggest directions for building new ones. Feedback from the groups will be used in designing a funding proposal to Howard Hughes Medical Institute, which currently supports several Science Outreach programs. For more information, call Victoria May, Science Outreach director (314) 935-6846, ext. 1, or e-mail may@biology.wustl.edu. To participate in either group, RSVP to Amy O’Brien, (314) 935-6846, ext. 2, or obrien@biology2.wustl.edu.

K-8 teachers focus group
April 12, 4-5 p.m., location TBA. Share plusses and minus-es from the Edu 6000 program. What are your interests and needs for future Edu 6000 courses or other programs?

Modern Genetics focus group
April 19, 4-5 p.m., location TBA. Share your success stories, concerns and needs for improving the Modern Genetics high school program.

Space still available:
Field Ecology for Biology Teachers starts April 7

Join aquatic ecologist Phyllis Balcerzak for a series of biology lab and field experiences. Previous course participants Laura Montgomery of Francis Howell North High School and Tom Kazanecki of Parkway Central High School have field-tested and revised the lab activities, so course materials are ready to use in the classroom.

Course and curriculum include:
• Laboratory and field research investigative approaches
• Diversity of life and water quality in Forest Park ponds
• Effect of different fertilizers on plant growth
• Lab activities demonstrating competition and natural selection
• Computer simulations of changing ecosystems and ecological problems
• Effect of human activity on natural environments
• Receive water quality test kits and other materials

The first class will meet in Rebstock 126 on April 7, 2001, from 9 a.m.-4 p.m. The following classes meet at various field locations, April 21, April 28, May 12 and May 19. University College will provide two graduate credits in biology to course participants for a registration fee of $50 (collected the first class day). Tuition is waived due to funding from the Missouri Coordinating Board for Higher Education. To register or learn more, call Gary Corbin, Modern Genetics program coordinator, at (314) 935-8138 or e-mail corbin@biology.wustl.edu.

Science Outreach People

Jonnie L. Robinson, teacher at Long Middle School (St. Louis Public Schools), received a master’s degree in elementary administration from UM-St. Louis in January.

Congratulations to these teachers and students who were selected to participate in the new Summer Research and Curriculum Enrichment Program through the Young Scientists Program at WU School of Medicine. They are: Vaughan Morrill and Stacey Schoeffel, Roosevelt High School; Jerry Campbell and Arthur Hager, Cleveland NJROTC High School; Terrilyn Clardy and Jacqueline Holton, Sumner High School; and Kubie Pillay, Central Visual and Performing Arts High School.
Teaching Teams bring discovery and fun to science clubs in University City

WU’s undergraduate student Teaching Teams bring hands-on science to area classrooms, generally one two-visit activity at a time. But for the 2000-01 school year, the involvement has become much deeper. WU undergraduates are working as science club activity leaders at University City’s Barbara Jordan and Delmar-Harvard schools. The collaboration has been a win-win for all involved: elementary students, teachers and club sponsors, school administrators and the WU undergraduates.

“The kids really enjoy it, and the Wash. U. students really work well with them,” says William Cochran, second grade teacher and club co-sponsor at Barbara Jordan Elementary School. “It’s good the club leaders are students,” he adds. “Kids don’t want to hear from us seasoned teachers all the time, and it’s good to have people closer in age to them.”

Glenda Young, fourth grade teacher and club co-sponsor at Barbara Jordan, agrees with Cochran. “There’s a good ratio of students to Wash. U. students, so there’s more one-on-one,” she explains. “The Wash. U. students are younger and have more energy—and they’re very patient with the kids,” she says.

Sophomore biology major Michelle Encarnación definitely has enthusiasm to spare—and share—with the science club at Barbara Jordan. “It was extremely exciting to see 14 kids plunge into science fair projects all out,” she says. Encarnación wants to pass on the interest in science that she caught from one of her teachers.

“When I was in elementary school, I had one teacher who was completely into science—it just takes one person to show how cool science is and what you can do with it,” she explains.

“Our students aren’t club sponsors–teachers do that—but they do attend every meeting and provide the hands-on activities,” says Elaine Alexander. As coordinator of the Teaching Teams program, Alexander shares her 30+ years of middle school science teaching expertise with the WU students.

Lafrance Owens, Sumner High School student, performs a sink and float activity (photo courtesy of Yolanda Lamprich).

Modern Genetics: SO seeks new partner schools

• Thanks to a $200,000 grant from The Monsanto Fund, Science Outreach is seeking three to four new Modern Genetics partner schools for the 2001-02 school year, and another three to four new schools in 2002-03. Participation in the Modern Genetics program includes summer teacher workshops, curriculum and lab supplies and support. For more information, call Gary Corbin, Modern Genetics coordinator, (314) 935-8138, ext. 1, or e-mail corbin@biology.wustl.edu.

• The Modern Genetics for All Students curriculum remains in a draft stage, but is undergoing extensive rewrites thanks to David Kirk, professor of biology, who has taken over as lead writer and editor. The new version will be available online in August at www.nslc.wustl.edu/science_outreach/index.html.

• Refresher workshops for teachers at our partner schools are available at no cost. Call Corbin to schedule.
**Science in the Real World: Microbes in Action summer workshop**

June 18-22, 2001, 8:30 a.m.-3:30 p.m., UM-St. Louis.

Registration fee: $15, Credit: $50 for 2 hours graduate credit in biology.

This is a hands-on laboratory-based workshop that uses microorganisms as a tool to teach important biological concepts. The focus of the workshop is on real world issues in science and technology. The workshop will include lab activities on the following topics:

- Making microbial media
- Growing cultures
- Staining bacteria
- Enzymes from microbes
- Lactose intolerance and yogurt
- Oil degradation by microbes
- Yeast fermentation
- Food spoilage
- Food preservation techniques

Each participant will receive a complete curriculum package that includes all the units covered in the workshop. In addition, each teacher will be provided with free, ready-to-use classroom kits for these lab activities during the academic year.

Course instructors are Teresa Thiel, microbiologist and professor of biology, University of Missouri-St. Louis; Martha Thompson, teacher, Francis Howell North High School; and Elaine Kilmer, teacher, John Burroughs School.

This project is funded by the National Science Foundation, The Foundation for Microbiology and the Pfizer Foundation. Participants are asked to pilot test the labs in their classrooms and provide feedback to the program.

For more information, contact Mark Kalk, (314) 935-8138, ext. 2, e-mail kalk@biology.wustl.edu or visit http://www.umsl.edu/~microbes.

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**St. Louis Earth Day, April 22**

St. Louis Earth Day 2001 (theme: “Our Water, Our Rivers”) includes activities around town on Saturday, April 21 and in Forest Park on Earth Day, Sunday, April 22. Call Karla Wilson, (314) 962-5838 or e-mail earthdaystl@aol.com for more information. Visit www.stlouisearthday.org for a free Water Education Teachers’ Guide and for a full listing of Earth Day events. Activities on April 22 include these events at the World’s Fair Pavilion in Forest Park:

- **Opening ceremony**, 10:30 a.m.
- **Earth Day Festival**, 11 a.m.-7 p.m.
- **Mini Boat Regatta**, 1-2 p.m.
- **All Species Parade**, 2-3 p.m.
- **Closing ceremony**, 6:45 p.m.

**Project Aria News**

Project Aria is Washington University’s School of Engineering and Applied Science hands-on space engineering/science research, education, and outreach program. To learn more about Project Aria, visit www.aria.seas.wustl.edu or e-mail Keith Bennett, project director, at bennett@seas.wustl.edu.

- The Aria-2 Experiment Package on the Shuttle Discovery launched on March 8, carrying 124 experiments from 22 schools in the St. Louis area.
- There’s still room for one high school to participate in Aria-3, a joint U.S./Australia project that will launch small samples of Australian flora and fauna into space on a future shuttle mission.

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**Young Scientist Program**

The Young Scientist Program at WU School of Medicine is collaborating with faculty to donate old, used equipment and supplies to schools in need through their new Lab Equipment and Supply Recycling Program. For information, call Jennifer Mosher, program coordinator, (314) 747-0843, or e-mail mosherj@dbbs.wustl.edu.

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Missouri Department of Conservation summer workshops
For more information, visit www.conservation.state.mo.us, or contact Barb Sandhagen, (314) 301-1500, ext. 2242 or sandhb@mail.conservation.state.mo.us. Workshop graduate credit is available for some workshops through Lindenwood University for a fee.

**Connecting Children’s Books and Conservation**, June 12-14, 9 a.m.-4 p.m., Powder Valley Conservation Nature Center

**WOW–Wonder of Watersheds!**, June 19-22, 9 a.m.-4 p.m., August A. Busch Memorial Conservation Area

**Lewis & Clark and the Big River Confluence**, June 26-28, 9 a.m.-4 p.m., Rockwoods Reservation

**Connecting Art & Conservation in the Classroom**, July 10-12, 9 a.m.-4 p.m., Powder Valley Conservation Nature Center

**Conservation Education for Early Childhood Teachers**, July 14, 8:30 a.m.-12:30 p.m., August A. Busch Memorial Conservation Center

**Using Writing to Teach Conservation**, August 7-9, 9 a.m.-4 p.m., Outdoor Teacher Resource Center (Soular)

**Conservation Projects: WET, WILD and Learning Tree**, August 8-10, 9 a.m.-4 p.m., Rockwoods Reservation

Saint Louis Zoo summer workshops
To receive a registration form, call the Zoo at (314) 768-5466. Contact Jim Jordan, associate curator of education, (314) 781-0900, ext. 340, e-mail Jordan@stlzoo.org, or visit www.stlzoo.org/content.asp?page_name=summerteacher for more information. An optional hour of graduate credit is available for each course through Lindenwood University for $60.

**Taxonomy Zooteacher Workshop**, June 28-29; 8:30 a.m.-4:30 p.m.

**Animal Adaptations and Behavior**, July 10-12; 8:30 a.m.-3:30 p.m., 10 a.m.-4 p.m., 6:30-8:30 p.m., 8:30 a.m.-12:30 p.m.

**Animal Artistry**, June 13-14; 8:30 a.m.-4:30 p.m.

**Spineless Wonders: Monarchs, Mantids & More**, July 25-26; 8 a.m.-4:30 p.m.

**Endangered Species and Zoo Conservation**, July 18-19; 8 a.m.-4:30 p.m.

**Wild Wonders for Wee Ones**, August 11, 18; 8:30 a.m.-4:30 p.m.

Missouri Botanical Garden summer workshops
The Missouri Botanical Garden offers a range of courses and workshops in biology, botany, ecology, environmental issues, technology, math, and science education. Graduate university credit is available for most of the summer courses. Credit is available through Lindenwood University, Maryville University, University of Missouri-St. Louis, and Webster University. For further information about any of the teacher programs, please call (314) 577-5144 or visit www.mobot.org/education/index.html.

**GEMS Leaders Workshop** (Great Explorations in Math and Science) August 6-8, 9 a.m.-4 p.m., Missouri Botanical Garden

**Discover Botany**, June 25-29, 9 a.m.-4 p.m., Missouri Botanical Garden

**Diversity of Life: Plants Alike and Different**, June 13-15, 9 a.m.-4 p.m., Missouri Botanical Garden

**Ethnobotany Explorations**, July 9-13, 9 a.m.-4 p.m., Litzsinger Road Ecology Center and Shaw Nature Reserve

**Ecology of Populations and Communities**, July 30-August 3, 9 a.m. to 4 p.m., Litzsinger Road Ecology Center

**Science Seekers**, June 18-22, Missouri Botanical Garden

**Mapping Natural Disasters**, July 16-20; Sept. 28-29; March 1-2, 2002; 9 a.m.-4 p.m., Litzsinger Road Ecology Center

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