PLEASE NOTE:
This brochure describes a graduate course beginning in Summer 2013 and continuing into the following academic year. It is primarily (80%) supported with federal funds distributed by the Ohio Board of Regents under its Improving Teacher Quality State Grants Program and by the interest and supplementary funds and services of local school administrators and Otterbein University.

“The demos were wonderful! Instructors were energetic, informative and helpful. A great mix of learning and fun!”
– OP2 2010-11 participant

“I really liked all of the hands-on ideas to help students understand the concepts. I use plenty of hands-on, but this was so much more! Also, the higher level questions to get a deeper understanding of the concepts! Incredible!”
– OP2 2010-11 participant

AN OPPORTUNITY PERFECT FOR YOU!
Free: Five Semester Hours of graduate credit and over $600 in materials that are teacher friendly and classroom ready.

School districts are asked to contribute a paid sub day and $175 materials fee.

INTERESTED IN PARTICIPATING IN OP2: OPERATION PHYSICS 2013-2014?

Please write or call:
Wendy Sherman Heckler
The Office of Academic Affairs
Otterbein University
1 South Grove Street
Westerville, OH 43081
614.823.3395

Please Include:
Name
Address
City/State/Zip
10 digit phone number
e-mail address

• Enjoyable, usable activities
• Down-to-earth
• For the non-scientist
• Enhance your understanding of physical science
• Receive ideas and materials to teach your students effectively

Classes meet for two weeks during the summer, followed by one Friday and four Saturdays during the school year.
WHAT IS OP2: OPERATION PHYSICS?
OP2: Operation Physics is a teacher-friendly, proven-effective graduate course for grade 4-9 teachers with science education responsibilities. This tuition-free, five (5) credit hour, graded Otterbein course combines basic physical science concepts with hands-on materials and activities. OP2: Operation Physics is modeled after a successful NSF-developed program that has served teachers in northeast Ohio for over 20 years.

From the Lab to the Classroom
The course includes instruction in physical science concepts appropriate for middle school and constructivist teaching strategies that will lead to student (and teacher) involvement and understanding. Activities are designed to help teachers learn basic concepts and most of the activities can be used or adapted for use in the middle school classroom.

Instructors
The OP2: Operation Physics team is made up of instructors with extensive science education experience.

Wendy Sherman
Associate Vice President
Heckler for Academic Affairs/
Dean of University
Programs
Otterbein University

Dave Reber
Science Teacher
Black River Local Schools

Karen Richards
Master Teacher
Columbus City Schools

David Robertson
Physics Professor
Otterbein University

OP2: OPERATION PHYSICS UNITS

Sound: Participants gain experience with properties of sound waves and their expression in everyday life.

Light: Light boxes and pinhole cameras are used to discuss the behavior of light, images and shadows, reflections and optical illusion.

Color and Vision: Physiology of the eye, perception, vision-correcting lenses, rainbows and effects of color mixing are demonstrated.

Electricity: Static charges, electrical fields, conductors and insulators, and basic circuits are investigated with hands-on activities.

Magnetism: Effects of various magnets and magnetic fields and some relationships to electricity are made tangible.

Matter and Its Changes: Observable properties of matter, its physical states and models to explain the nature of matter are explored.

Energy and Heat: Addresses basic relationships between matter and energy and ways to illustrate the laws of thermodynamics in daily life.

Measurement: Considers the origins of measurement systems, importance of basic and derived measurements and their applications.

Forces and Motion: Time, space, velocity, inertia and acceleration are introduced with student-involving activities and devices to take into classrooms.

Simple Machines: The how and why of simple machines leads to a study of forces, work and power.

Forces in Fluids: See how air and water respond to forces, share Bernoulli’s insight and discover how a bumblebee flies.

Astronomy: Perspectives on the sun, the seasons, our local planetary system and the stars challenge students to engage in activities related to time, space and motion.

This Is For You!

Not much background in physical science, but you’d teach it if you could?

You’d teach physics concepts and critical thinking better and more often if you had practical lessons for middle grade students?

You’ve noticed that children’s perceptions and explanations about natural events are sometimes vastly different from the scientific view?

You’ve heard about “hands-on”, “minds-on” science inquiry and want to try some?

The mention of Ohio’s Model Science Curriculum makes you feel uncertain about how to prepare your students?

You’d like a solid graduate course in which to explore selected topics in physics, children’s thinking and science education?

If you answered YES to any of the above questions, consider taking OP2: Operation Physics – an Otterbein University graduate course funded by the Ohio Board of Regents for area teachers.

Location
Course will meet at Otterbein University in Westerville, Ohio; one session will be held at the Science Education Council of Ohio meeting.

Class Calendar 2013-2014

June 17-21, 2013  8 a.m.-4 p.m.
June 24-28, 2013  8 a.m.-4 p.m.
September 14, 2013 8 a.m.-4 p.m.
November 9, 2013  8 a.m.-4 p.m.
February 1, 2014  8 a.m.-4 p.m.
March 8, 2014   8 a.m.-4 p.m.
Friday field trip date TBD