

**PTED 7281 Technology Enhanced Research in the Science Classroom**

3 Semester Hours

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**COURSE DESCRIPTION**

This course provides opportunities for participants to learn about scientific research methodology and the use of technology from scientists currently engaged in research. Subsequently participants will be engaged in mini-research activities designed to provide practice on scientific research design and the use of various types of technology, such as computer /calculator based sensors, digital microscopes, cameras, and/or iPods. As a culminating assignment participants will develop detailed plans for a research project (appropriate for their teaching assignment) which can be used to help their students better understand and use scientific methods of research and technological tools.

**CONCEPTUAL FRAMEWORK**

The conceptual framework of the College of Education UWG forms the basis upon which programs, courses, experiences, and outcomes are created. By incorporating the theme "Developing Educators for School Improvement," the college assumes responsibility for preparing educators who can positively influence school improvement through altering classrooms, schools, and school systems (transformational systemic change). Ten descriptors (decision makers, leaders, lifelong learners, adaptive, collaborative, culturally sensitive, empathetic, knowledgeable, proactive, and reflective) are integral components of the conceptual framework and provide the basis for developing educators who are prepared to improve schools through strategic change. National principles (INTASC), propositions (NBPTS), and standards (Learned Societies) also are incorporated as criteria against which candidates are measured. Depending on the specific nature of the independent project, students would address one or more of the NBPTS propositions.

The mission of the College of Education is to develop educators who are prepared to function in diverse educational settings with competencies that are instrumental to planning, implementing, assessing, and re-evaluating existing or proposed practices. This course's objectives are related directly to the conceptual framework and appropriate descriptors, principles or propositions, and learned societies standards are identified for each objective. Class activities and assessments that align with course objectives, course content, and the conceptual framework are identified in a separate section of the course syllabus.

**COURSE OBJECTIVES:**

Participants will:

1. Discuss the scientific literature related to the significance of student involvement in scientific research.

2. Demonstrate the basic knowledge and skills required to design and conduct scientific research and to use technologies appropriate for that research.
3. Explore sources of grants and other funding to assist with the acquisition of materials and equipment to enhance research experiences for students.
4. Apply the knowledge and skills gained to develop and present a research project design which will engage students in scientific methods of research and use of technological tools.

## **TEXTS, READINGS, AND INSTRUCTIONAL RESOURCES**

### **Text:**

Martin J. Shapiro, Editor in Chief. 2005. *Guiding Student Research: Making Research Happen in Your School*, NCSSMST.

### **Resources:**

Annetta, Leonard A.,Michelle Cook, and Maya Schultz (2007). Video Games: A Vehicle for Problem-based Learning. *eJournal of Instructional Science and Technology*. Vol. I, No. 10.

Dempsey, Brian, David Hibbett, and Manfred Binder. 2007. Bridging the gap between classrooms and research laboratories. *The Science Teacher*, April-May, 33-37.

Georgia Department of Education. (2005). Georgia Performance Standards. Atlanta, GA.

Heller Research Associates. (2005). Impact of Handheld Graphing Calculator Use on Student Achievement in Beginning Algebra. Oakland, CA: Joan Heller, Deborah Curtis, Rebecca Jaffe, and Carol Verboncoeur.

Laine, Phyllis (2003).The use of instructional technology to learn and teach science is a natural approach for today's undergraduate. *The Journal of Interactive Online Learning*, Vol. I, No.

Millar, Mark (2005). Technology in the classroom. *The Science Teacher*, October, 23-41.

National Committee on Science Education Standards and Assessment and the National Research Council,(1995). *National Science Education Standards*. Washington, DC: National Academies Press.

Zaikowski, Lori and Paul Lichtman. 2007. Environmental research puts science into action. *The Science Teacher*, April-May, 47-51.

## **LINKS TO CONCEPTUAL FRAMEWORK**

This course provides an extensive study of the PTED learner, the school curriculum, and selected methods and techniques of instruction and organization appropriate for the selected PTED school setting in light of current trends and issues. The instructor determined assignments will serve as a synthesis for nearly every one of the descriptors found in the COE conceptual framework. Students taking this course are graduate students currently in classroom settings. Field experience related assignments will be drawn from their individual school setting. Assignments and discussion should assist them in internalizing the framework concepts. Collectively, the assignments for this course should allow the students to demonstrate achievement in the areas to be determined by the instructor.

**ASSIGNMENTS, EVALUATION PROCEDURES, AND GRADING POLICY**

1. **Class Participation.** Participants are expected to attend all sessions of the Learning Festival classes (15hours) as well as the follow up classes (30 hours). Attendance at the Learning Festival classes will be documented on a log sheet signed by the presenters.  
**20 points**
2. **Course Reflection Log.** The sessions attended each day will be summarized and should include name/contact for the presenter, significant technical and instructional information presented, resource information, and further ideas to investigate.  
**20 points**
3. **Discussion Board.** Following each of the sessions spent with the scientist, participants will post a summary of significant events on the Discussion Board and should post comments and/or questions with regard to the posts of other class members.  
**15 Points**
4. **Student Project/Lesson Plan.** Participants will be expected to develop a plans for a grade/subject appropriate research project that will engage students in scientific research and use of technology. The plan will be presented to the class on the day of the final exam.  
**30 points**
5. **Final Evaluation.** Students will complete a pre/post assessment on scientific research, use of technology, and methods for involving students.  
**15 points**

**CLASS OUTLINE – Meetings on 6/3, 6/4, and 6/5/09 will be in Education Center 248-249; other meetings as specified or TBA**

<b>Date</b>	<b>Class Activities</b>
<b>Wednesday 6/3/09 5 hrs EC 249</b>	<b>Attend plenary sessions Attend 1 concurrent session presented by Science Researcher (to be named) Attend 2 concurrent sessions on science investigations/technology</b>
<b>Thursday 6/4/09 5 hrs EC 249</b>	<b>Attend plenary sessions Attend 1 concurrent session presented by Science Researcher (to be named) Attend 2 concurrent sessions on science investigations/technology</b>
<b>Friday 6/5/09 5 hrs EC 249</b>	<b>Attend plenary sessions Attend 1 concurrent session presented by Science Researcher (to be named) Attend 2 concurrent sessions on science investigations/technology</b>
<b>6/8 – 7/10/09 15 hrs Location TBA</b>	<b>Schedule and attend three 5 hr sessions with research scientist</b>
<b>6/8/09 and 6/15/09 2.5 hrs ea = 5 hrs</b>	<b>Attend online class meeting to discuss lesson planning</b>
<b>7/6/09 5 hrs EC 249 (evening)</b>	<b>Attend class meeting and individual online session to discuss lesson planning</b>
<b>7/17/09 5 hrs EC 249 (evening)</b>	<b>Final class meeting – individual presentations of research project proposals</b>

Students are expected to adhere to the highest standards of academic honesty. Plagiarism occurs when a student uses or purchases ghost-written papers. It also occurs when a student utilizes the ideas of or information obtained from another person without giving credit to that person. If plagiarism or another act of academic dishonesty occurs, it will be dealt with in accordance with the academic misconduct policy as stated in Undergraduate Catalog, and Graduate Catalog.