

CRSS 8220
Advanced Topics in Crop & Soil Sciences

Practical Applications of Classroom Science

Course Particulars:

This is a three hour credit, A-F course that generally meets for four weeks middle of June – middle of July on the Tifton Campus of the University of Georgia.

Course Content:

Textbooks rarely reveal how science is applied in the real world. This course for teachers will show them how scientists use inquiry-based procedures every day to solve problems in the agricultural world. Teachers paired with scientists will examine successful and unsuccessful attempts to solve the current research problems.

Evaluation Procedures:

Grades will be assigned on the standard 90-100 = A; 80-89 = B, etc.

Class Participation and knowledge of topic areas	50%
Based on month long internship	
Assignments	
Portfolio	15%
Lesson Plans	30%
Workshop Reports	5%
or	
Implementation of Lesson Plans	5%
or	
Presentation to other Science Teachers	5%

Instructor:

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Class Topics:

Teachers will choose 1 of the following areas to stay in for a month. Recurring themes in each department will be science as inquiry, understanding about the scientific process, environmental concerns, integrated pest management, special problems encountered in research methods, and future research projects.

Animal and Dairy Science

- Methods of reproduction in cattle
- Development of cow pastures
- Improved methods of milking dairy cows
- Development of catfish and shrimp in Georgia

Entomology

- Effects of insects on crops
- Understanding moths
- Ant control
- Advancement in waste disposal

NESPAL

- Lab Safety
- Science & Technology in local, national, & global settings using GPS/GIS
- Biotechnology
- Technology in the classroom

Plant Pathology

- Effects of fungus and disease on crops
- Advancements in pesticide use
- Methods for identifying bacteria or fungus

Crop & Soil Sciences

- Plant genetics
- Crop growth and development
- Plant nutrition

Biological & Agricultural Engineering

- Watershed projects – water & nutrient movement
- Agricultural engineering
- Environmental systems

USDA Research

- Forensics
- Advancement in waste disposal
- Sensory perceptions of insects
- EPA concerns

Horticulture

- Research projects involving plasti-culture and drip irrigation
- Native plants
- Chemical reactions
- Composting
- Nutrient preservation

Proposed Activities:

The Tifton Campus of the University of Georgia, including both the College of Agricultural and Environmental Sciences and the United States Department of Agriculture will provide teachers in South Georgia an internship experience.

Teachers will be paired with a scientist for a month. Activities will center on current research projects. Several of last summer's projects involved teachers in the testing of different chemicals to control fire ants, transfer of genetically modified tissue cultures, DNA analysis to confirm viruses and bacteria in specimens, the new technologies of Global Positioning Systems and Geographic Information Systems, new and native plant species to Georgia, natural waste management systems, chemical reactions in grain bins, physical and chemical manifestations of plant pathogens, test parameters for setting up research experiments, and extraction of cytoplasm for ELISA analysis. Projects are numerous and cover many aspects of earth, physical, and life sciences.

One day each week, teachers will meet as a group to discuss the week's experiences and work on Lesson Plans for correlating the week's activities with science objectives they must teach in their classrooms. Working with a Valdosta State University science education professor, teachers will formulate instructional methods for inquiry-based science and the technology methods to deliver it.

Before their summer internship begins, the teachers will be asked to attend an Orientation Session, and during the internship, participants will be offered a chance to attend workshops at the beginning and end of the summer program. To sustain contact with the teachers and help them maintain contact with each other, we will partner with Georgia Tech to offer teachers two follow-up programs in the fall and spring, involving science teachers from all over Georgia sharing experiences. School administrators are encouraged to visit teachers during their internships and are sent a schedule of locations and times. Administrators are also invited to attend an end of the session wrap-up where they hear reports from teachers and scientists about the summer experience.

Class Assignments:

Class Participation & Knowledge of Topic Area – will be determined by major professor.

Portfolio – a daily account of the month-long summer experience. It will include materials, processes, and products acquired throughout the summer. It should also include national standards, a personal needs assessment, workshops, presentations of prior year Classroom Implementation Plans, grant information, equity materials, career/workplace information, research papers, etc. Maintain personal reflections on your work experiences and their impact on your vision and goals for your classroom.

Lesson Plans – a lesson plan based on your summer experience that you could use in your classroom. These should follow the HE²CA² inquiry-based instructional model for lesson organization – hooks, excursions, explanations, connections, applications, and assessments as defined by Georgia Tech’s Center for Education Integrating Science, Math, and Computing.

Choose one of the following:

1. Workshop Report –a written report from the required science workshop. Report should summarize content of workshop giving your impressions of how you might use the information in your classroom. Include any follow-up contacts or information you might want to pursue as well as thoughts on positive and negative aspects of the workshop.
2. Implementation Plan – a visit from a scientist to observe how summer knowledge is being implemented in the classroom or a trip with students to the Experiment Station Campus to show students some aspect of the summer program.
3. Present summer experience to teachers in your school, RESA area, or other science workshop.