Engineering Research Methods in Environmental Management

Summer 2022

Meeting Day: Tuesday, Thursday, Saturday @ 9:00 AM – 12:00 PM EST

Meeting Location: Penland Building

Course Instructors: Jim Marra, jimmarra@bellsouth.net
                        Paul Ebel, PaulEbel@aol.com

Office Hours: By appointment

Prerequisites: Junior or senior standing in engineering or science field

Topics Covered:
1. Experimental safety
2. Conduct of research and development
3. Experimental design
4. Effective presentation and effective technical writing
5. Risk and risk assessment
6. Nuclear Basics and environmental management/waste processing
7. Research funding, proposals and negotiations
8. Scheduling, budgeting, and project management for research and development

Course Objectives:
1. Students will learn practices to safely and efficiently plan and conduct research experiments
2. Students will learn about technical communication in both written and oral form. Students will practice written and oral communications through assignments and projects
3. Students will learn nuclear fundamentals
4. Students will learn principles of risk and risk assessment practices
5. Students will learn basic project management principles
6. As a final project, students will plan and present research work from the proposal stage through final results

Grading System:

A	90-100
B+	85-89
B	80-85
C+	75-79
C	70-74
D+	65-69
D	60-64
F	<60

Oral Presentation and Written Report	20%
Homework assignments	20%

Quiz	10%
Group Project	30%
Final Exam	20%

Oral presentation - students will be required to give a presentation on a technical topic of their choice to demonstrate understanding of effective presentation skills

Written report – students will write a technical report to demonstrate understanding of accepted report writing format and dissemination of technical information

Homework – students will demonstrate grasp of materials presented through assignments concentrating on written technical communication

Group project – student teams will formulate a research program from the proposal stage to execution of the work that responds to a "call for proposal." The teams will develop a proposal and make a presentation to a "panel" that provides a research plan that includes: problem definition, schedule and budget estimates, safety assessments, experimental design, expected outcomes including future application of results.

Class Attendance: Students are expected to attend and actively participate in class

SRNL Field Trips:

Experimental planning and conduct of research and development: Students will meet with SRNL personnel. Students will interface with researchers to learn about lab practices associated with safety, conduct of research and development, data acquisition, laboratory notebooks, and experimental measurement. Students will tour research laboratories.

Experimental reporting/presentation and career discussions: Students will meet with SRNL personnel including an overview of a research project by technical researchers from project inception to reporting and presentation of results. Students will be able to interface with researchers to inquire about research practices.

Writing Labs and Writing Consultations

USCA's Writing Center will be provide supplemental instruction covering a variety of grammar, usage, professional, and technical writing topics. These sessions are mandatory and will be held from 1:00 to 3:00 pm as indicated in the course outline.

Trained Writing Center consultants will be available for one-on-one or group consultations.

For more information about USCA's Writing Center please see our website at www.usca.edu/writing-center. To contact Dr. Skye Roberson and the Writing Center consultants with questions/concerns, or to set up an appointment, please email writingroom@usca.edu .