Syllabus

NUC K111:	Radiation Health Safety Laboratory
Instructor:	William R. (Bob) Salen (cell: 860- 912-2682)
	bobsalen@sbcglobal.net
Office Hours:	By appointment
Required Texts:	Nuclides and Isotopes, Current Edition, Bechtel Marine Propulsion Corporation
Materials:	Provided Laboratory Equipment; Computer Access; Scientific Calculator

Course Description:

This course is designed to give the student hands-on experience working with a variety of radiation monitoring sources and analytical devices. The students will also gain experience in the analysis and interpretation of counting data.

The material is intended to compliment other nuclear program course material such as nuclear physics, systems, instrumentation, and most directly, the Radiation Health Safety class K110.

Formal Program Outcomes (Nuclear):

The course is designed to assist in achieving Nuclear Engineering Technology associates degree program outcomes as listed in the current Three Rivers Community College catalogue.

Learning Objectives for this Course:

1. Practice and observe radiation laboratory safety procedures in the handling of radioactive test sources and laboratory equipment.
2. Familiar with the operation and capabilities of portable radiation monitoring equipment such as:
    a. Canberra Radiagem Portable Monitor
    b. Canberra MCB2 Portable Monitor
    c. SE International Model 4EC Portable Monitor
    d. Personal Ion Chamber (PIC) Exposure Monitor
3. Use and interpret information displayed on portable radiation monitor instrumentation.
4. Adjust and utilize personal radiation monitoring dosimeters such as Pocket Ion Chambers (PIC).
5. Identify and characterize alpha, beta and gamma radiation emissions using basic shielding methods.

6. Understand and utilize the ALARA (As Low as Reasonably Achievable) principles of time, distance and shielding.
7. Interpret readings on portable radiation monitoring equipment and relate to the significance of health effects on the human body.
8. Using laboratory spectroscopy equipment, identify radioactive nuclides and their relative abundance in a given radioactive sample using statistical principles, counting methods and computer based data libraries.
9. Calculate future and past radioactive source intensity over a specified time interval using half-life, provided data and certification documents.
10. Use electronic and hardcopy Chart of the Nuclides to determine decay modes, half-life and relative nuclide stability.
11. Working as a team, demonstrate ability to dress-out in anti-contamination clothing, survey a simulated radioactively contaminated area, and follow accepted methods to control the spread of radioactive contamination.
12. Work with classmates on assignments and scenarios to demonstrate teamwork, peer checking, error reduction, and the production of superior outcomes.

Laboratory Activities:

In the laboratory, students will actively participate in discussions and assignments as collaboration is in itself an essential element of learning. The proper use of radioactive sources, texts, handouts, internet data and other resources are required elements to support laboratory work.

Outside the Laboratory:

Homework is typically not assigned as laboratory activities and projects normally take place within the physical confines of the laboratory itself.

Course Grading:

Your work is expected to evolve in a positive direction as the weeks pass by. You are expected to attend laboratory sessions regularly and inform the instructor via email or text if you cannot attend. Grade deductions may be imposed for poor attendance and/or bad behavior. Typically, your final grade depends on several factors:

Adherence to safety rules and procedures: **25%**

Students are required to strictly follow radiation laboratory safety rules and procedures. Violations may result in grade reductions or ejection from the laboratory.

Laboratory Assignments: **50%**

Working in teams, students must successfully complete laboratory experiments using the instructor provided guides.

Participation and Critical Thinking: **25%**

Students must successfully collaborate with other team members and be able to solve problems that require deeper analysis.

Grading Scale
A = 90-100 (Discretionary + or -)
B = 80-89 (Discretionary + or -)
C = 70-79 (Discretionary + or -)
D = 62-69 (Discretionary + or -)
F = < 62 or incomplete

Special Notes:

1. If you have a disability that may affect your progress in this course, please meet with a Disability Service Provider (DSP) as soon as possible. Please note that accommodations cannot be provided until you provide written authorization from a DSP.

TRCC Disabilities Service Providers Counseling & Advising Office Room A-119	
Matt Liscum (860) 383-5240	• Physical Disabilities • Sensory Disabilities • Medical Disabilities • Mental Health Disabilities
Chris Scarborough (860) 892-5751	• Learning Disabilities • ADD/ADHD • Autism Spectrum

2. Females that are pregnant or expect to become pregnant during the conduct of this course may not participate in laboratory sessions that involve radiation exposure. Alternate methods and assignments may be constructed to achieve equivalency as approved by the Nuclear Technology Program department head.