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Course Outline for RADS 40B

EMERGENCY RESPONSE AND MONITORING

Effective: Fall 2018

I. CATALOG DESCRIPTION:
RADS 40B — EMERGENCY RESPONSE AND MONITORING — 1.00 units

A course designed to provide overview and understanding of radiological emergencies and instrumentation. Builds upon principles, concepts, and terminology from 40A, and introduces practical use of radiological survey equipment.

1.00 Units Lecture

Prerequisite
RADS 40A - Radiation Safety
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:
- Industrial Safety

	MIN
Lecture Hours:	18.00
Expected Outside of Class Hours:	36.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. RADS40A
1. Identify the basic principles of atomic energy, radioactivity, and decay
2. Assess hazards associated with the use of ionizing radiation
3. Determine biological effects and risks from radiation exposure
4. Estimate dose and risks to individuals and populations
5. Identify sources of radiation, including artificial and natural sources

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Explain radiation instrument operations
B. Identify proper instruments for characterization of radiological conditions
C. Evaluate data from radiation measurement equipment
D. Identify and be familiar with emergency response resources at the federal, state, international, and industry levels
E. Describe elements and factors in emergency planning
F. Demonstrate proper methods for performing and documenting radiological surveys
G. Explain methods for monitoring doses to emergency personnel, including both internal and external dosimetry

V. CONTENT:
A. Radiation instrumentation
1. Detector theory
2. Types of instruments
3. Field survey techniques
4. Laboratory equipment and techniques
B. Emergency responses
1. Federal state
2. International
3. Industry
C. Emergency planning
1. Resources
2. Techniques

3. Notifications
4. Training

VI. METHODS OF INSTRUCTION:
A. **Field Trips** -
B. **Lecture** -
C. **Demonstration** - (classroom)
D. Practical exercises, e.g., using equipment and personal protection equipment
E. **Audio-visual Activity** - Video and overhead presentation
F. **Guest Lecturers** - Guest presenters from industry and/or field trips
G. **Discussion** - (group)

VII. TYPICAL ASSIGNMENTS:
A. Knowledge check
1. List three items that should be checked or verified before using a survey instrument.
2. List the four principle routes of entry for internal dosimetry.
B. Problem solving
1. In a graphy, the voltage plateau is shown indicating the response of a gas-filled radiation detector to ionizing radiation.
a. Please identify the region corresponding to each lettered portion of the graph.

VIII. EVALUATION:
A. **Methods**

1. Exams/Tests
2. Quizzes
3. Field Trips
4. Class Participation
5. Home Work

B. **Frequency**

1. One two hour final exam
2. Weekly quizzes
3. One field trip
4. Daily class participation
5. Weekly homework

IX. TYPICAL TEXTS:
1. Johnson, Thomas. *Introduction to Health Physics.* 5th ed., McGraw-Hill Education/Medical, 2017.
2. Domenech, Haydee. *Radiation Safety: Management and Programs.* 1st ed., Springer International Publishing, 2016.

X. OTHER MATERIALS REQUIRED OF STUDENTS: