

Course Specifications

Course Title:	Radiation Pollution
Course Code:	ENS 391
Program:	Bachelor of Environmental Sciences
Department:	Environmental Sciences
College:	Meteorology, environment & arid land agriculture
Institution:	King Abdulaziz University







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A. Course Identification

1. Credit hours:			
2. Course type			
a.UniversityCollegeDepartmentOthers			
b. Required Elective			
3. Level/year at which this course is offered: 4th Level / 2nd Year	3. Level/year at which this course is offered: 4th Level / 2nd Year		
4. Pre-requisites for this course (if any): ENS 100			
5. Co-requisites for this course (if any):			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	70
2	Blended	5	10
3	E-learning	10	20
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	30

B. Course Objectives and Learning Outcomes

1. Course Description

This course focuses on Radiation and radioactive materials, differentiate between types of radiation (ionized and non-ionized radiation), the effects of radiation on the environment and health of human and how to protect.

2. Course Main Objective

Define radiation and radioactivity, and discuss exposure pathways, health effects, and risk reduction by controlled exposure.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	Knowledge and Understanding	
1.1	Listing the types of radiation.	
1.2	Defining radioactivity and radioactive equilibrium.	
1.3	Naming exposure pathways.	

	CLOs	Aligned PLOs
1.4	Listing the effects of radiation.	
1.5	Naming the different methods of measuring the radiation.	
2	Skills :	
2.1	Demonstrate independent role and as part of a team.	
2.2	Assess resources, time and cooperate with the other members of the group.	
2.3	Show results of work to others.	
3	Values:	
3.1	Explain radioactive reactions.	
3.2	Summarize the environmental effects of radiation.	
3.3	Explain the risk estimation from radiation.	

C. Course Content

No	List of Topics	Contact Hours
	What is radiation?	
1	Pollution of the environment by radiation from natural and manmade	
	sources.	
2	Types of radiation.	
3	Radioactivity, half-life, decay chains, radioactive equilibrium.	
4	Alfa particles, Beta particles, Gama rays.	
5	Exposure pathways.	
6	Health effects of radiation	
7	Ways to monitor the radiation	
8	Protection	
	Total	

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Listing the types of radiation.	 Lecture Involvement of students in active discussion about topics. 	 In class quizzes Midterm and final exams Homework
1.2	Defining radioactivity and radioactive equilibrium.	 Lecture Involvement of students in active discussion about topics. 	 In class quizzes Midterm and final exams Homework
1.3	Naming exposure pathways.	 Lecture Involvement of students in active discussion about 	 In class quizzes Midterm and final exams Homework

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		topics.	
1.4	Listing the effects of radiation.	 Lecture Involvement of students in active discussion about topics. 	 In class quizzes Midterm and final exams Homework
2.0	Skills		
2.1	Demonstrate independent role and as part of a team.	Seminar Writing group reports.	Discussion & grading
2.2	Assess resources, time and cooperate with the other members of the group.	Seminar Writing group reports.	Discussion & grading
2.3	Show results of work to others.	Seminar	Discussion & grading
3.0	Values	•	• • •
3.1	Explain radioactive reactions.	• Homework assignments. Problem solving.	Grading homework assignments. Discussing results
3.2	Summarize the environmental effects of radiation.	• Homework assignments. Presentation	Grading homework assignments. Discussing results
3.3	Explain the risk estimation from radiation.	• Homework assignments. Presentation	Grading homework assignments. Discussing results

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework x 6	biweekly	10
2	Midterm exam	9	20
3	Final exam	15	40
4	Project and reports	13-16	15
5	Quiz x 4	Every 3	10
Э		weeks	
6	Participation in class		5

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Office hours 4/week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Turner, J.E., $({}^{\vee} \cdot {}^{\vee})$ "Atoms, Radiation, and Radiation Protection", 3^{rd} edition. John Wiley & Sons, Inc., USA. ISBN: 978-3-527-40606-7
Essential References Materials	Hala, J., and Navratil, J.D., (2003) "Radioactivity, Ionizing Radiation, and Nuclear Energy" Konyoj, Brno. Martin, J.E., (2000) "Physics for Radiation Protection", Wiley-Inter science.
Electronic Materials	Websites on the internet that are relevant to the topics of the course
Other Learning Materials	Multimedia associated with the text book and the relevant websites

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms – 30 seat maximum
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, AV,
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
StudentFeedbackonEffectiveness of Teaching	- Course evaluation by student Students- faculty meetings	Indirect
Teaching by the Program/Department Instructor	 Departmental council discussions Discussions within the group of faculty teaching the course 	Indirect
Teaching tools	Peer reviews	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify) Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	April 2021