

Kingdom of Saudi Arabia

T6. Course Specifications (CS)

Course Specifications

Institution: Najran University	Date: 31-03-2017
College/Department : Applied medical sciences / Radiological sciences	

A. Course Identification and General Information

1. Course title and code: Radiation protection - 313 RAD-2			
2. Credit hours : 2 (1+1)			
3. Program(s) in which the course is offered. : Bachelor of Radiological sciences (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course Dr. Mohammed K. Saeed (male section) Dr. Soheir Soliman (female section)			
5. Level/year at which this course is offered : level 5 / 3rd year			
6. Pre-requisites for this course (if any): Radiation Physics - 211 RAD-3			
7. Co-requisites for this course (if any): None			
8. Location if not on main campus : Main campus			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom	<input checked="" type="checkbox"/>	What percentage?	100
b. blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments: The lecture involves : Practice good presentation techniques Effective questioning Students discussion			

B Objectives

<p>1. What is the main purpose for this course?</p> <ul style="list-style-type: none"> • Enabling students to understand the basic principles of radiation protection and helping students understand how to deal with radioactive sources • Use of personal dosimetry correctly • Training students how to deal with sources of radiation safely in the carriage, use and storage; • Act effectively and correctly in the event of a radiological accident.
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p> <ul style="list-style-type: none"> • Updating the textbooks. • Explain strategy of the course in the beginning of the semester. • Encourage the students to see more details in web sites and reference books in the library. • Discussing some selected problems in each chapter.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

<p>Course Description:</p> <p>This course will build on the topics covered in Radiation Physics. In addition students will be introduced to principles of radiation protection of radiological hazards may occur in diagnostic radiology and nuclear medicine for every patient, staff and the public, and that will be through study radiation and radioactivity in the universe, the major discoveries in radiation physics, X-ray, transition radiation, radiation interactions, radiation shields, chemical and biological effects of radiation, detection and measurement of radiation, radiation protection, standards and exposure limits.</p>

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
<p>Naturally occurring radiation</p> <p>Discovery and Interpretation Background Radiation, Cosmic Radiation and Naturally Radioactive Series.</p> <p>Major discoveries in radiation physics</p> <p>Discovery of Radioactivity, Binding Energy of Nuclei, and Calculation of Binding Energy</p>	3	9

Radioactive transformation Processes of Radioactive Transformation, Mathematics of Radioactive Transformation, Effective Half-life, Radioactivity Calculations, Half-life Determination, Activity-mass Relationships, Specific Activity and Radioactive Series Transformation Interactions of radiation with matters Cross-Section, Alpha Particle Interactions, Charged Particles Calculations, and Photon Interactions.	3	9
Radiation shielding Shielding of Alpha-Emitting Sources, Shielding of Beta-Emitting Sources, Shielding of Photon Sources, Shielding of Good Geometry Photon Sources, and Half-Value and Tenth-Value Layers	3	9
Chemical and biological effects of radiation Time frame for radiation effects, Physical and pre-chemical changes in irradiated water, Chemical stage, and Chemical yields in water biological effects	3	9
Radiation detection and measurement Semiconducting Detectors, Gamma Spectroscopy, Personnel Dosimeters, Film Badges, and Instruments Calibration Radiation protection criteria and exposure limits Objective of radiation protection, Elements of radiation protection programs, Occupational limits, The safety of radiation sources and the design of departments of nuclear medicine. Protection of workers, public and Patients, and Radioactive waste.	3	9

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	15		30			45
Credit	1		1			2

3. Additional private study/learning hours expected for students per week.	3hrs/week
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Describe the basic principles of radioactive transformation, Interactions of radiation with matters , radiation shielding and Chemical and biological effects of radiation.	<ul style="list-style-type: none"> Lectures Practical in labs Discussing with illustrating 	<ul style="list-style-type: none"> Written examinations Practical exams. Assignments and quizzes Oral questions.
1.2	Define quantities and units in radiation protection such as activity, exposure, absorbed dose, quality factor and dose equivalent.		
2.0	Cognitive Skills		
2.1	Evaluate the different types of radiation detection equipment.	<ul style="list-style-type: none"> Lectures Practical in labs Group-learning activity such as a seminars and tutorials. Problem solving Brain storming Discussion 	<ul style="list-style-type: none"> Written examinations Practical exams. Assignments and quizzes Oral questions.
2.2	Calculate radiation dose		
3.0	Interpersonal Skills & Responsibility		
3.1	Show team work spirit in groups on laboratory experiments and thoughtful discussion and interpretation of data.	<ul style="list-style-type: none"> Practical in labs Group-learning activity such as a seminars and tutorials. Group discussion. Cooperative learning 	<ul style="list-style-type: none"> Practical exam. Observation Student presentation / seminar and discussion.

3.2			
4.0	Communication, Information Technology, Numerical		
4.1	Operate effectively the different informational resources including the library resources and websites	<ul style="list-style-type: none"> • Practical in lab. ▪ Cooperative learning ▪ Self-learning to the global of information networks 	<ul style="list-style-type: none"> • Practical exam. • Observation • Student presentation / seminar and discussion.
4.2			
5.0	Psychomotor		
5.1	Perform the physics experiments.	<ul style="list-style-type: none"> • Practical in lab. ▪ Cooperative learning ▪ Writing lab report 	<ul style="list-style-type: none"> • Practical exam. • Observation
5.2	Drawing graphs of experiments correctly.		

6. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Mid-term written exam	7 th	20
2	Practical mid-term exam	8 th	10
3	Continuous assessment	During the course	10
4	Practical final exam	16	20
5	Final written exam	17	40
6	Total		100

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Six office hours per week are offered to support students individually.
- Reachable via email.
- Personal web pages of academic members staff in university website.

E Learning Resources

1. List Required Textbooks
<ol style="list-style-type: none"> 1. An Introduction to Radiation Protection, six edition, Alan Martin, Sam Harbison, Karen Beach, Peter Cole, (2012). 2. Atoms, Radiation, and Radiation Protection 3rd Edition, James E. Turner, (2017).
2. List Essential References Materials (Journals, Reports, etc.)
<ol style="list-style-type: none"> 1. Physics for Radiation Protection: A Handbook, Second Edition. James E. Martin, (2006)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
<ol style="list-style-type: none"> 1. https://www.iaea.org/nuclearenergy/library-inln/ 2. https://www.iaea.org/sites/default/files/radiation0204.pdf
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
<ol style="list-style-type: none"> 1. http://sciencebooksonline.info/physics.html 2. http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html 3. http://de.physnet.net/PhysNet/optics.html 4. https://www.facebook.com/ScienceChannel/ 5. https://www.iaea.org/
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.
Lab. Notes: Will be distributed to the students by the lecturer

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
<ol style="list-style-type: none"> 1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) <ul style="list-style-type: none"> • Lecture room (8 x 15m) equipped with about 20 student seats, • Lab. (8 x 15 m) equipped with about 20 student seats. 2. Computing resources (AV, data show, Smart Board, software, etc.) <ul style="list-style-type: none"> • White Board, computer, Data Show , Overhead projector and laptop. 3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) <ul style="list-style-type: none"> • Library, and Seminar Room and Wi-Fi internet connections

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> • University online questionnaire for evaluation the course by students. • Observing the students opinions recorded in the college student site. • Appeal & suggestions box.

<p>2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <p>Teaching is evaluated through:</p> <ul style="list-style-type: none"> • Student assessments • Peer review • Evaluation of head department • Self-evaluation & the instructor responses • Course report is provided every semester and improvement plans due to these sources.
<p>3 Processes for Improvement of Teaching</p> <ul style="list-style-type: none"> • Program learning outcomes are reviewed • Courses specifications • Student questionnaires • Courses and program reports • Independent evaluation of the program • Workshops held by skills development unit • Annual reports of External Examiner
<p>4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)</p> <ul style="list-style-type: none"> • Check marking of final exam papers by peer review
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> • Study the results of the course learning outcome assessment • The department provides continuous internal review. • Continuous support and monitoring by learning & teaching committee of quality and development deanship.



Name of Instructor: Dr. Mohammed K. Saeed

Signature:

Date: 08/06/1438 H

Program coordinator: Alfatih Hasan Mohamed Albadri

Signature:

Date: 23/06/1438 H

Name of Instructor: Dr. Soheir Soliman

Signature:
H

Date Report Completed: 03-07-1438

Program Coordinator :Dr. Mawahib Sayed Ahmed Aldosh

Signature:

Date Received 04/ 08/1438