



ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

**Course Specifications
(CS)**

Essential of Radiotherapy (547 RAD -3)

Course Specifications

Institution Najran university	Date of Report 04/05/1437 H
College/Department College of Applied Medical Science / Department of Radiological Sciences	

A. Course Identification and General Information

1. Course title and code: Essential of Radiotherapy (547 RAD -3)			
2. Credit hours 3 (2+1)			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course Dr. Mohammed Khalil Saeed			
5. Level/year at which this course is offered 9th level/ 5th year			
6. Pre-requisites for this course (if any) No			
7. Co-requisites for this course (if any) No			
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:			

B Objectives

<p>1. What is the main purpose for this course?</p> <p>By the end of this course, the student will be able to:</p> <ul style="list-style-type: none"> • Know the essential physics of radiotherapy. • Knowledge of radiation therapy equipment and the definitions of different types of cancers. • The side effects of radiotherapy. • Taking care of patient during treatment and how to determine the dose. 	
<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>	
The most important practices in the four dimensions	Actions developing and improving the course
First: Scientific content for course	a. Improvement proposals for weaknesses in content
	b. Most important good practices regarding the content of the course, and means of strengthening
Second: Methods and means of learning	a. Improvement proposals for weaknesses in the methods and means of learning
	b. Most important good practices regarding the methods and means of learning, and means of strengthening
Third: Textbook	a. Improvement proposals for weaknesses in the textbook
Four: Course coordinator/professor	a. Improvement proposals for weaknesses in the performance of the course coordinator/ professor
	b. Most important good practices regarding the course coordinator/ professor , and means of strengthening

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

Course Description :

This course aims to present radiation therapy physics with emphasis on developing areas and less common radiation therapy treatment modalities such as stereotactic radiotherapy and radiosurgery (SRS/SRT) in the field of radiation oncology. An awareness of beam data acquisition methods, their utilization in radiotherapy planning and treatment, quality assurance of radiotherapy equipment and medical dosimetry of the above modalities will also be covered.

1 Topics to be Covered		
List of Topics	No of Weeks	Contact hours
<p>Understanding Radiation Therapy:</p> <ul style="list-style-type: none"> • Introduction to Radiation Oncology • What is Radiation Therapy? • How does Radiation Therapy work? • Brief History of Radiation Therapy • How is radiation therapy used? • Types of Radiation Therapy • Side effects of Radiation Therapy • Is Radiation Therapy Safe? 	2	8
<p>Clinical Radiation Generators:</p> <ul style="list-style-type: none"> • Kilovoltage Units • Linear Accelerator • Betatron • Cyclotron • Cobalt – 60 • Heavy Particle Beams 	2	8

<p>Dose Distribution and Scatter Analysis:</p> <ul style="list-style-type: none"> • Phantom • Depth Dose Distribution • Percentage Depth Dose • Tissue – Air Ratio • Scatter – Air Ratio • Dose Calculation 	2	8
<p>Treatment Planning:</p> <ul style="list-style-type: none"> • Isodose Distributions <ul style="list-style-type: none"> ✓ Isodose Chart ✓ Parameters of Isodose Curves ✓ Combination of Radiation Fields ✓ Tumor Dose Specification for External photon Beams • Patient Data, Corrections, and Set-up <ul style="list-style-type: none"> ✓ Acquisition of Patient Data ✓ Treatment Simulation ✓ Treatment verification ✓ Patient Positioning • Field Shaping <ul style="list-style-type: none"> ✓ Custom Blocking ✓ Multileaf Collimators 	4	16
<p>Electron Beam Therapy:</p> <ul style="list-style-type: none"> • Electron Interaction • Characteristics of Clinical Electron Beams 	2	8
<p>Head and Neck Radiotherapy Techniques</p> <p>Breast Radiotherapy Technique.</p>	3	12

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30	0	30	0	0	60
Credit	2	0	1	0	0	3

3. Additional private study/learning hours expected for students per week.	1 hour./w
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
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Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The *National Qualification Framework* provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

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. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Describe the essential concepts of physics including radiation production, interaction of radiation with matter, their biological effects and radiation protection in radiotherapy.	Lectures	Written Exams
1.2	Tell some techniques in radiotherapy	Group discussion & presentations	Practical Exams
2.0	Cognitive Skills		
2.1	Explain the basic radiation therapy physics.	Lectures	Written Examination Practical Examination Home work-quizzes
2.2	Estimate the procedures and protocols appropriate to apply radiotherapy.	<ul style="list-style-type: none"> • Lectures • Practical sessions • Tutorial 	Written Examination Practical Examination Home work-quizzes
2.3	Summarize the safety concern associated with the treatment.	<ul style="list-style-type: none"> • Lectures • Practical sessions • Tutorial 	Written Examination Practical Examination
2.4	Explain the essential sciences concepts necessary for applications of radiotherapy.	<ul style="list-style-type: none"> • Lectures • Practical sessions • Tutorial 	Written Examination Practical Examination Home work-quizzes
3.0	Interpersonal Skills & Responsibility		
3.1	Demonstrate ethical and legal manners during performance.	<ul style="list-style-type: none"> • Lectures • Discussions with students on ethical behaviour • Self learning • Group work 	<ul style="list-style-type: none"> • Continuous evaluation

4.0	Communication, Information Technology, Numerical		
4.1	Operate effectively the different informational resources including the library resources and websites in addition to extracting information and data	<ul style="list-style-type: none"> • Solved problems • Active learning • Web based assignment • Student presentation 	<ul style="list-style-type: none"> • Continuous evaluation • Assignment
5.0	Psychomotor		
5.1	N/A		
5.2			

5. 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	Continuous assessment	During course	10%
2	Written Midterm Exam	7th	20%
3	Practical Midterm Exam	8th	10%
4	Written Final Exam	17th	40%
5	Practical Final Exam	16th	20%
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)

4 h per week

E. Learning Resources

1. List Required Textbooks

- The Physics of Radiation Therapy, Faiz M. Khan, Williams and Wilkins, 2004
- Cossmann, Peter H. Advances in Image-guided Radiotherapy - The Future is in Motion. European Oncology Review 2005 - July (2005)
- Dawson, LA; Sharpe, MB (October 2006). "Image-guided radiotherapy: rationale, benefits, and limitations". Lancet Oncol. 7 (10): p. 848–858. doi:10.1016/S1470-2045(06)70904-4
- Jaffray, DA; JP Bissonnette, T Craig (1999) [1999]. "X-ray Imaging for Verification and Localization in Radiation Therapy in Modern Technology of Radiation Oncology (suppl. 1)". Modern Technology of Radiation Oncology. Madison, WI: Medical Physics Pub.. ISBN 0-944838-38-3.

2. List Essential References Materials (Journals, Reports, etc.)

- a. International Commission on Radiation Protection (ICRP) Journal.
- b. International Commission on Radiation Units and Measurements (ICRU) Journal.
- c. International Organization of Medical Physics (IOMP) reports.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- a. International Organization of Medical Physics (IOMP) reports.

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- a. <http://www.nucmedinfo.com/Pages/physic.html>
- b. www.icrp.org
- c. www.icru.org

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

None

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.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Lecture room suitable for 25 students. Lap for practical sections
2. Computing resources (AV, data show, Smart Board, software, etc.) Computers, multimedia in lecture room.
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) Library supplied with reference text books, electronic resources

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching <ul style="list-style-type: none"> Questionnaire evaluation of the course (End-of-term university evaluation of course by students (to be electronically completed by students)) Evaluation by group discussions
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor <ul style="list-style-type: none"> Peer observing teaching Questionnaire Reciprocal classroom visits
3 Processes for Improvement of Teaching <ul style="list-style-type: none"> Attending training sessions Attending workshops to facilitate the exchange of experiences amongst faculty members Scheduling regular meetings with other colleagues where problems are discussed and solutions are given

- Discussing the challenges in the classroom with colleagues and members of the Department Counsel
- Encouraging faculty members to attend conferences on professional development
- Keeping up to date with pedagogical theory and practice
- Setting goals for achieving excellence in teaching at the beginning of each new semester after reviewing previous semester's teaching strategies and results and after considering students' feedback
- Keeping up to date with refereed articles and books related to the topics of the course

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)

- Annual course review- report prepared by course touter
- Periodic review and evaluation- external personal involved
- Peer teaching observation
- Visiting examiner report
- Accreditation report.

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Studying of the questioners and staff remarks and student marks to obtain improvement plan.
- Updating annually the course topics according to the recommendations of ICRU and ICRP.
- Develop special software for training students in practices sessions.
- Compare syllabi and course description to those found in other universities (including those on the Internet)
- Try to contact other professors in different universities who are teaching similar courses (including well-known institutions) to exchange views regarding the optimal ways to improve the course

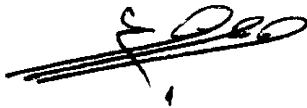
Faculty or Teaching Staff: Dr. Mohammed Khalil Saeed



Signature:

Date Report completed 4/3/1437 H

Received by: Alfatih Hasan Albadri Program coordinator



Signature:

Date: 4/3/1437 H