Jordan University of Science and Technology
Faculty of Applied Medical Sciences
Radiologic Technology Department

RA721 Advanced Radiation Physics

First Semester 2024-2025

Course Catalog
2 Credit Hours. This course provides an in-depth exploration of radiation physics principles and their applications in diagnostic radiography. Topics include advanced concepts in radiation interactions, imaging modalities, radiation safety, and emerging technologies in medical imaging.
Teaching Method: Blended

Text Book	
Title	Bushberg's Physics of Medical Imaging
Author(s)	Stewart C. Bushberg et al
Edition	5th Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Introduction to Radiologic Sciences and Patient Care	Arlene M. Adler et al	7th Edition	
3	Essentials of Radiographic Physics and Imaging	James Johnston et al	2nd Edition	

Class Schedule & Room

Tentative List of Topics Covered		
Weeks	**Topic**	**References**

Week 1	Radiation Interactions 1	From **1**, From **2**, From **3**
Week 2	Radiation Interactions 2	From **1**, From **2**, From **3**
Week 3	Radiographic Image Formation 1	From **1**, From **2**, From **3**
Week 4	Radiographic Image Formation 2	From **1**, From **2**, From **3**
Week 5	Advanced Imaging Modalities 1	From **1**, From **2**, From **3**
Week 6	Advanced Imaging Modalities 2	From **1**, From **2**, From **3**
Week 7	Radiation Dosimetry and Safety 1	From **1**, From **2**, From **3**
Week 8	Radiation Dosimetry and Safety 2	From **1**, From **2**, From **3**
Week 9	Advanced Topics in Radiation Physics 1	From **1**, From **2**, From **3**
Week 10	Advanced Topics in Radiation Physics 2	From **1**, From **2**, From **3**
Week 11	Case Studies and Applications 1	From **1**, From **2**, From **3**
Week 12	Case Studies and Applications 2	From **1**, From **2**, From **3**
Week 13	Integration of radiation physics principles in clinical practice 1	From **1**, From **2**, From **3**
Week 14	Integration of radiation physics principles in clinical practice 2	From **1**, From **2**, From **3**

Week 15	Review of current research and advancements in medical imaging 1	From **1**, From **2**, From **3**
Week 16	Review of current research and advancements in medical imaging 2	From **1**, From **2**, From **3**

Mapping of Course Outcomes to Program Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
Demonstrate a comprehensive understanding of advanced radiation physics principles.	20%	
Analyze the interactions of radiation with matter and their implications in diagnostic imaging.	20%	
Evaluate the principles and operation of various imaging modalities used in diagnostic radiography	20%	
Apply radiation safety measures and regulations in clinical practice.	20%	
Critically assess emerging technologies and advancements in medical imaging.	20%	

Relationship to Program Student Outcomes (Out of 100%)												
PLO B1	PLO B2	PLO B3	PLO B4	PLO B5	PLO B6	PLO B7	PLO M1	PLO M2	PLO M3	PLO M4	PLO M5	PLO M6

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