

RAD 2602 - Radiographic Physics

Fall 2026 Syllabus, Section 01, CRN 43626,

Credit hours: 2

Instructor

Lisa Galich

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Public Instructor Information

Professional Qualifications: Associate of Applied Science Radiologic Technology, Kent State University, 2008

Bachelor of Radiologic and Imaging Sciences Technology, Kent State University, 2011

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Course Description

2602. General theories of physics including units of measurement; mechanics; structure of matter; electrostatics; magnetism; electro- dynamics- electrical circuits; fundamentals of electromagnetism; and rectification are presented. The production and properties of x-ray, x-ray tubes, circuits and equipment are emphasized. Mathematical solutions of practical problems are included. 2 Lecture Hours Prereq.: C or better in RAD 1508. 2 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Essentials of Radiographic Physics and Imaging, 4th Edition	James Johnston, Ph.D., R.T. (R)(CV), FASRT	9780323930673

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Day	Date	Reading(s)	Proposed Topic	Due/To Prepare for Class
Tue	8/25	Course Syllabus	Syllabus Review and Course Expectations	
Thu	8/27	Chapter 1: Introduction to the Imaging Sciences, Pgs. 1-13	Review: Physics Measurements, Calculations, and Equipment	ASSIGNED: Clover Assignment 1 Radiography Math Fundamentals
Tue	9/1	Chapter 2: Structure of the Atom, Pgs. 16-23	Anatomic Structure	
Thu	9/3	Chapter 2: Structure of the Atom, Pgs. 16-23	Electron Binding, Excitation, and Ionization	
Tue	9/8	Chapter 3: Electromagnetic and Particulate Radiation, Pgs. 26-31	Electromagnetic Radiation and Fundamental X-Ray Properties	QUIZ: Chapters 1 and 2
Thu	9/10	Chapter 3: Electromagnetic and Particulate Radiation, Pgs. 26-31	Photon Relationships and Inverse- Square Law	DUE: Clover Assignment 1
Tue	9/15	Chapter 4: The X-Ray Circuit, Pgs. 34-50	Electrical Principles	QUIZ 2: Chapter 3 and Inverse Square Law ASSIGNED: Clover Assignment 2 Electrical Physics and X-Ray Circuit
Thu	9/17	Chapter 4: The X-Ray Circuit, Pgs. 34-50	X-Ray Circuitry and Transformers	
Tue	9/22	Chapter 4: The X-Ray Circuit, Pgs. 34-50	Generators, Rectification, and Tube Loading	QUIZ 3: Chapter 4 DUE: Clover Assignment 2
Thu	9/24		EXAM 1: Chapters 1-4	

Tue	9/29	Chapter 5: The X-Ray Tube, Pgs. 53-60	Review X-Ray tube components and Electron Focusing	ASSIGNED: Clover Assignment 3 X-Ray Tube, Production, Beam and Interactions
Thu	10/1	Chapter 5: The X-Ray Tube, Pgs. 53-60	Tube operation, Focal-spot principles, and Heat Management	
Tue	10/6	Chapter 6: X-Ray Production, Pgs. 62-71	Thermionic Emission, Acceleration, Focusing, and Deceleration	
Thu	10/8	Chapter 6: X-Ray Production, Pgs. 62-71	Target interactions, X-Ray spectrum, Beam quality and quantity	
Tue	10/13	Chapter 7: X-Ray Interactions with Matter, Pgs. 74-80	Coherent, Photoelectric, and Compton Interactions	QUIZ 4: Chapters 5 and 6
Thu	10/15	Chapter 7: X-Ray with Matter, Pgs. 74-80	Attenuation, Remnant Radiation, Body-Part thickness, and Atomic Number	
Tue	10/20	Chapter 7: X-Ray interactions with Matter, Pgs. 74-80	Clinical Applications of Photon Interactions, Attenuation, Beam Quality and Quantity	DUE: Clover Assignment 3
Thu	10/22		EXAM 2: Chapters 5-7	
Tue	10/27	Chapter 8: Image Production, Pgs. 83-92	Image formation, Receptor exposure, and Exposure Factors	ASSIGNED: Clover Assignment 4 Exposure and Technique Factors
Thu	10/29	Chapter 8: Image Production, Pgs. 83-92	Distance, Magnification, Distortion, Focal Spot, and Motion	
Tue	11/3	Chapter 9: Image Quality and Characteristics, Pgs. 94-109	Image-quality Characteristics	
Thu	11/5	Chapter 10: Digital Image Receptors, Pgs. 111-125	Digital receptors and Image acquisition	DUE: Clover Assignment 4 ASSIGNED: Clover Assignment 5 Digital Radiography and Informatics
Tue	11/10	Chapter 10: Digital Image receptors, Pgs. 111-125	Digital Processing, Exposure Indicators, and Informatics	
Thu	11/12	Chapter 11: Radiographic Exposure Technique, Pgs. 127-147 Chapter 13: Exposure Technique Selection, Pgs. 168-187	Exposure Technique, AEC, Technique Charts, and Selection	QUIZ 6: Chapters 9 and 10 DUE: Clover Assignment 5 ASSIGNED: Clover Assignment 6 Image Quality, Evaluation, and OC
Tue	11/17	Chapter 12: Scatter Control, Pgs. 150-166 Chapter 13: Exposure Technique Selection, Pgs. 168-187	Scatter, Grids, and Technique Adjustment	QUIZ 7: Chapter 11 and 13 Selected Topics
Thu	11/19		EXAM 3: Chapters 8-13	
Tue	11/24	Chapter 14: Image Evaluation, Pgs. 187-190	Image Evaluation, Artifacts, Errors, and Quality Control	DUE: Clover Assignment 6 ASSIGNED: Clover Assignment 7 Fluoroscopy Equipment and Operation
Thu	11/26	No Class		
Tue	12/1	Chapter 15: Fluoroscopy Imaging, Pgs. 192-210	Fluoroscopic Equipment, Image Chain, and Operating Modes	
Thu	12/3	Chapter 16: Additional Equipment, Pgs. 213-222	Additional Equipment, Equipment OC, and Intro to CT Physics	QUIZ 8: Chapters 14 and 15 DUE: Clover Assignment 7
Tue	12/8	800am - 1000am	COMPREHENSIVE FINAL EXAM	

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