

Fall 9-1-2018

AHXR 121.01: Radiographic Imaging I

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MISSOULA COLLEGE, UNIVERSITY OF MONTANA

RADIOLOGIC TECHNOLOGY PROGRAM

AHXR 121 Radiographic Imaging I

Fall 2018

Semester Credits: 3

Instructor: Dan Funsch

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Office: MC 420

Office Hours Mon-Fri 7 – 9 am

COURSE DESCRIPTION

Content presents the principles of x-ray physics and image production, along with the factors that influence image quality. Subjects covered include basic chemistry, electromagnetism, x-ray equipment, and the production of radiographic images including digital image receptors and computer technology.

CO-REQUISITES: AHXR 100, AHXR 101, AHXR 140 & 141

REQUIRED TEXT: Radiologic Science for Technologists, 11th Edition, Stewart C. Bushong

STUDENT ASSESSMENT AND GRADING

Final grades will be determined by points received for on line modules, quizzes, class attendance & participation, tests, and a comprehensive final exam.

The final grade will be based on:

- | | |
|----------------------------|-----|
| • Quizzes | 10% |
| • participation/attendance | 10% |
| • on line modules | 30% |
| • In-class tests (3) | 40% |

Grading Scale:

- | |
|--------------|
| 100 – 90 = A |
| 89 – 80 = B |
| 79 – 70 = C |
| 69 – 60 = D |

Note: Students must pass this course with a “B” (80%) to remain in the Radiology Technology Program.

Instructions for On-Line Modules

Code for the on-line class is on our Moodle Class Introduction Page. Register for the class, and complete the learning modules, along with the quizzes and tests.

Academic Conduct

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or disciplinary sanction by the University.

All students need to be familiar with the Student Conduct Code. The Code is available for review online at <http://www.umt.edu/SA/VP/SA/index.cfm/page/1321>.

STUDENTS WITH DISABILITIES: Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please be prepared to provide a letter from your DSS Coordinator.

ATTENDANCE POLICY: All students are expected to come to class each, on time. Cell phones must be turned off. Constructive participation is expected. Disruptive behavior will not be tolerated.

**Syllabi are subject to change*

STUDENT PERFORMANCE OUTCOMES

Upon completion of this course, the student will be able to:

1. Define potential difference, current and resistance.
2. Define the general components and functions of the tube and filament circuits.
3. Compare generators in terms of radiation produced and efficiency.
4. Discuss fixed and mobile radiographic equipment in terms of purpose, components, types and applications.
5. Demonstrate operation of various types of permanently installed and mobile radiographic equipment.
6. Describe functions of components of automatic exposure control (AEC) devices.
7. Identify the components of diagnostic x-ray tubes.
8. Explain protocols used to extend x-ray tube life.
9. Discuss fixed and mobile fluoroscopic equipment in terms of purpose, components, types and applications.
10. Explain image intensified, flat panel and pulsed fluoroscopy.
11. Indicate the purpose, construction and application of the fluoroscopic monitor
12. Discuss quality control,(QC)
13. Evaluate the results of standard QC tests.
14. Describe fundamental atomic structure
15. Explain the processes of ionization and excitation.
16. Describe the electromagnetic spectrum
17. Describe wavelength and frequency and how they are related to velocity
18. Explain the wave-particle duality phenomena.
19. Identify the properties of x-rays.
20. Describe particulate radiation.
21. Differentiate between ionizing radiation and nonionizing radiation.
22. Describe radioactivity and radioactive decay in terms of alpha, beta and gamma emission.
23. Compare the production of bremsstrahlung and characteristic radiations.
24. Describe the factors that affect the x-ray emission spectrum.
25. Explain the factors that affect the x-ray emission spectrum
26. Discuss relationships of wavelength and frequency to beam characteristics.
27. Discuss the clinical significance of the photoelectric and modified scattering (Compton) interactions in diagnostic imaging.

See next page for a Class schedule

AHXR 121 Weekly Class Schedule – Fall 2018

Week of	READING ASSIGNMENT	Module Assignment/Due date
August 27	Class Introduction	Enroll in on-line class by next week
September 3	Labor Day – no class. Read for next week: Bushong: Chapters 1-3	Purchase textbook, complete Modules for Chapter 1, 2 & 3, including quizzes and the test. These are due Sept 10
September 10	In class lecture on Chaps 1, 2 & 3 Read for next week: Chapter 4: Electromagnetism	Modules for Chapter 4 including quizzes and the test are due Sept 17
September 17	In class lecture on Chap 4 Test review Chapters 1 - 4	Study for test
September 24	In-class test on Chapters 1 - 4 Read for next week: Chapter 5: X-ray System	Modules for Chapter 5 including quizzes and the test are due Oct 1
October 1	In class lecture on Chap 5 Read for next week: Chap 6: X-ray Tube & Chap 7: X-Ray Production	Modules for Chapters 6 & 7 including quizzes and the test are due Oct 8
October 8	In class lecture on Chaps 6 & 7 Read for next week: Chap 8: X-ray Emission & Chap 9: X-ray Interactions	Modules for Chapters 8 & 9 including quizzes and the test are due Oct 15
October 15	In class lecture on Chaps 8 & 9	Catch your breath & study for test
October 22	Test review Chapters 5 - 9	Study for test
October 29	In-class test on Chapters 5 – 9 Read for next week: Chap 10	Modules for Chapter 10 including quizzes and the test are Due Nov 5
November 5	In class lecture on Chap 10	Modules for Chapter 11 including quizzes and the

	Read for next week: Chap 11: Scatter Radiation	test are Due Nov 12
November 12	In class lecture on Chap 11 Read for next week: Chaps 14 & 15: Computers & CR	Modules for Chaps 14 & 15 including quizzes and the test are Due Nov 19
November 19	In class lecture on Chaps 14 & 15 Read for next week: Chaps 16 & 17: Digital	Modules for Chaps 16 & 17 including quizzes and the test are Due Nov 26
November 26	In class lecture on Chaps 16 & 17 Read for next week: Chap 18: Viewing the image	Modules for Chap 18 including quizzes and the test are Due Dec 3
December 3	Last day of class: Lecture on Chap 18 Test review chapters 10-18	Study for test
December 10	Final Exam Chapters 10-18 NOT comprehensive	Study for final