Fall 9-1-2024

AHXR 121.01: Radiographic Imaging I

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MISSOULA COLLEGE
UNIVERSITY OF MONTANA

Radiologic Technology Program **Fall 2024**

Course: AXHR 121: Radiographic Imaging I.

Instructor: Victor White, PhD, RT (R)

Credits: **4**

Classroom **MC Rad Classroom**

Office **MC 302**

Office Phone (406) 243-7872.

Office Hours **Fridays, Noon-500PM or by appointment or online.**

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Main Textbook Radiographic Imaging and Exposure, 6th Edition : Terri L. Fauber.2020. **ISBN: 97803236613932**

Other Textbook: Selman's The Fundamentals of Imaging Physics and Radiobiology. White, V. (2020). 10th Edition. Charles C. Thomas Publishers, Springfield, IL.

Jipp Notes: ***Radiologic Technology Concepts Guide (2022). Jipp, M.*** Complete Radiologic Technology Concepts Guide Book - Etsy

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/VPSA/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 on time. Cell phones must be turned off. Constructive participation is expected. Disruptive behavior will not be tolerated.

Course Description:

Introduction to physics of x-ray production. Includes factors of image quality and exposure methods: density, contrast, recorded detail, distortion.

Course Objectives: This course will help you understand:

1. The components of atomic structure and terminology
2. The components of a basic x-ray system
3. How radiation is produced
4. The x-ray beam
5. How radiation interacts with matter
6. The sources of radiation
7. Selection of technical factors
8. Computed/digital radiography imaging basics
9. Introduction to accessories used in radiography
10. Circuitry of the x-ray equipment

Outcomes Assessments and Grading Procedures
Grading Scale

A 100-93%
A- 92.99-90%
B+ 89.99-87%
B 86.99-83%
B- 82.99-80%
C+ 79.99-77%
C 76.99-73%
C- 72.99-70%
D+ 69.99-67%
D 66.99-63%
D- 62.99-60%
F 59.99-0%

Discussion/Participation	**10%**
Homework/Problems	**10%**
Formula/Math Quiz	**10%**
Ex**am 1**	**17.5%**
Exam 2	**17.5%**
Exam 3	**17.5%**
Exam 4	**17.5%**
Total	**100%**

The grade of below 75% is NOT a passing grade for the Radiologic Technology Program or to be able to take the ARRT (R) examination.

You must have a "C" (i.e.: 75%) or better in all Radiologic Technology courses to continue in the Radiologic Technology Program.

Make Up of Exams and Other Course Material will be allowed at the discretion of the instructor.

Note: Academic freedom gives the instructor the right and ability to change the syllabus and course content as needed to enhance student learning and successful class completion. **This syllabus is subject to change.**

AHXR 121:Radiographic Imaging I Schedule (Note: Subject to Change as Needed). Class meets on Tuesdays & Thursdays from 12:30 PM-14:50 PM in the MC Rad Classroom or hybrid/online if necessary (i.e.: COVID, Inclement Weather, etc.).

	Date	Fauber Topic(s) *Note: Primary Text.	Fauber Textbook Reading & End of Chapter Question Assignments	Selman's Topic(s)	Selman's 10th Edition Textbook Reading and End of Chapter Questions	Jipp Notes Topic(s)	Jipp Notes Chapters
Week 1	8/27 & 8/29	Radiation and Its Discovery	Ch. 1 Ch. 3	X-Rays: Production & Properties. Physical Concepts of Energy	Ch. 12 Ch. 3	Radiation Units of Measure	Chap 19
2	9/3 & 9/5	The X-Ray Beam	Ch. 2	The Structure of Matter	Ch 4	The X-Ray Beam	Chap 6

				Rectification & Rectifiers X-Rays: Production & Properties. Radiographic Quality	Ch. 11 Ch. 12 Ch. 18	X-Ray Interactions	Chap 7
3	9/10 & 9/12	Image Formation and Radiographic Quality **Exam 1: Chap 1,2 &3 Fauber.** **To help you study you may read Chap 4 & 12 Selmans/Chaps 6, 7, 11, 14, 15, 16 & 19 Jipp.**	Ch. 3	X-Rays: Production & Properties. Radiographic Quality	Ch. 12 Ch. 18	Image Contrast Quality Control Size and Shape Distortion Histograms and Image Evaluation Errors	Chap 11 Chap 17 Chap 14 Chap 15 & 16
4	9/17 & 9/19	Digital Image Characteristics	Ch. 4	Digital X-Ray Imaging	Ch. 24	Computed Radiography vs Digital Radiography Digital Imaging	Chap 9 Chap 10
5	9/24 & 9/26	Digital Image Processing	Ch.5	Digital X-Ray Imaging	Ch. 24	Digital Imaging	Chap 10

		Exam 2: Chap 4 & 5 Fauber. To help you study, you may read Chap 24 Selmans /Chaps 9,10, 15 & 16 Jipp.				Histograms and Image Evaluation Errors	Chap 15 & 16
6	10/1 & 10/3	Exposure Technique Factors	Ch. 6	X-Rays: Production & Properties Devices for Improving Radiographic Quality	Ch. 12 Ch.19	Exposure Factors	Chap 8
7	10/8 & 10/10	Scatter Control	Ch. 7	Devices for Improving Radiographic Quality	Ch. 19	Grids	Chap 12
8	10/15 & 10/17	Exposure Technique Selection	Ch. 8	X-Rays: Production & Properties X-Ray Circuits Radiographic Quality	Ch. 12 Ch. 14 Ch. 18	Exposure Factors Receptor Exposure	Chap 8 Chap 13
9	10/22 & 10/24	Film Screen Imaging (We Won't Cover This Chapter.) **Exam 3: Chaps 6,7 & 8 Fauber. To help you study, you may**	Ch. 9				

		read Chaps 12 & 19 Selmans/Chaps 8, 12 & 13 Jipp.					
10	10/29 & 10/31	Dynamic Imaging: Fluoroscopy	Ch. 10	Fluoroscopy	Ch. 20	Contrast: Water Soluble Iodine and Barium Sulfate Fluoroscopy	Chap 22 Chap 23
11	11/5 & 11/7			X-Ray Tubes	Ch. 13	X-Ray Tube	Chap 5
12	11/12 & 11/14			X-Ray Circuit	Ch. 14	Electrical Physics X-Ray Circuit	Chap 3 Chap 4
13	11/19 & 11/21			Rectification and Rectifiers	Ch. 11	X-Ray Circuit	Chap 4
14	11/26 **No Class on 11/28 Thanksgiving**.			Radiographic Quality	Ch. 18	Quality Control	Chap 17
15	12/3 & 12/5	**Quiz**: Formulas and Mathematics in Radiology (Instructor Handouts)/PACS/X-Ray Interactions and Jipp Equations Chap 1,2,3 & 7).				Equations PACS Electrical Physics X-Ray Interactions	Chap 1 Chap 2 Chap 3 Chap 7
16	12/10	**Exam 4: Chap 10 Fauber. To help you study, you may read**					

		Chaps 11, 13, 14, & 20 Selman's/Jipp Chaps 22& 23.					