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

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

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:  Grading Scale:
  • Quizzes 10%  100 – 90 = A
  • participation/attendance 10%  89 – 80 = B
  • on line modules 30%  79 – 70 = C
  • In-class tests (3) 40%  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/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 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.
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

<table>
<thead>
<tr>
<th>Week of</th>
<th>READING ASSIGNMENT</th>
<th>Module Assignment/Due date</th>
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</thead>
<tbody>
<tr>
<td>August 27</td>
<td>Class Introduction</td>
<td>Enroll in on-line class by next week</td>
</tr>
<tr>
<td>September 3</td>
<td>Labor Day – no class. Read for next week: Bushong: Chapters 1-3</td>
<td>Purchase textbook, complete Modules for Chapter 1, 2 &amp; 3, <strong>including quizzes and the test.</strong> These are due Sept 10</td>
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</tbody>
</table>
| 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 |
<p>| November 5 | In class lecture on Chap 10 | Modules for Chapter 11 <strong>including quizzes and the test</strong> |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Due Date(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 12</td>
<td>In class lecture on Chap 11&lt;br&gt;Read for next week: Chaps 14 &amp; 15: Computers &amp; CR</td>
<td>Modules for Chaps 14 &amp; 15 including quizzes and the test are Due Nov 19</td>
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<tr>
<td>November 19</td>
<td>In class lecture on Chaps 14 &amp; 15&lt;br&gt;Read for next week: Chaps 16 &amp; 17: Digital</td>
<td>Modules for Chaps 16 &amp; 17 including quizzes and the test are Due Nov 26</td>
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<td>November 26</td>
<td>In class lecture on Chaps 16 &amp; 17&lt;br&gt;Read for next week: Chap 18: Viewing the image</td>
<td>Modules for Chap 18 including quizzes and the test are Due Dec 3</td>
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<tr>
<td>December 3</td>
<td>Last day of class: Lecture on Chap 18&lt;br&gt;Test review chapters 10-18</td>
<td>Study for test</td>
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<tr>
<td>December 10</td>
<td>Final Exam Chapters 10-18&lt;br&gt;NOT comprehensive</td>
<td>Study for final</td>
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