

# RADIOLOGY (RADIOL)

## RADIOL/B M E/MED PHYS/PHMCOL-M/PHYSICS 619 – MICROSCOPY OF LIFE

3 credits.

Survey of state of the art microscopic, cellular and molecular imaging techniques, beginning with subcellular microscopy and finishing with whole animal imaging.

**Requisites:** PHYSICS 104, 202, 208, or 248 or PHYSICS/MED PHYS 265

**Course Designation:** Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Fall 2025

## RADIOL 910 – INDEPENDENT READING AND RESEARCH IN RADIOLOGY

2-8 credits.

Independent research under the supervision of faculty in the Department of Radiology. Student's research projects are individualized to meet individual student research goals within the context of faculty research needs.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Formulate a hypothesis or specific objective if study does not involve hypothesis generating research

Audience: Graduate

2. Conduct a thorough literature review of the specific research question

Audience: Graduate

3. Select and apply statistical methodologies appropriate for the proposed analyses

Audience: Graduate

4. Interpret results correctly and in context of previous findings from literature review

Audience: Graduate

## RADIOL 911 – IMAGING AND EMBRYOLOGY: THE BASIC SCIENCE OF FETAL DYSMORPHOGENESIS

2 credits.

The diagnosis and management of congenital abnormality requires an understanding of the basic principles of embryology, imaging, and genetics. Replicating how patients enter the medical system, the didactic path begins with ultrasound diagnosis of fetal abnormality. The embryological basis of the fetal malformations will be examined. From this center, exposure to advanced diagnostics, such as fetal echocardiography, fetal MRI, and genetic testing and counseling. Topics extend to early postnatal care (pediatric genetics and pediatric radiology). Participate in the Meriter Perinatal Conference, learn about genetic approaches to the diagnosis of fetal malformation syndromes, and learn the rudiments of an obstetrical sonogram.

**Requisites:** MED SC-M 810, 811, 812, and 813

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Demonstrate understanding of basic concepts of human dysmorphogenesis

Audience: Graduate

2. Describe various diagnostic approaches to human birth defects

Audience: Graduate

3. Apply basic concepts of embryology and genetics to developmental malformations

Audience: Graduate

4. Explain fundamentals of imaging diagnosis, with an emphasis on prenatal ultrasound

Audience: Graduate

5. Model logical thinking process to organize scientific discussion and presentation

Audience: Graduate

**RADIOL 912 – INTENSIVE TRAINING IN CLINICAL ULTRASOUND: PHYSICS, ANATOMY, SKILLS, TRANSLATION TO PRACTICE**

2 credits.

Intensive training in clinical ultrasound scanning, including the physical basis of the image generation, the resulting opportunities and limitations of this technique, and ultrasound anatomy and physiology. Practice scanning skills on classmates and phantoms in daily lab sessions and at the UW Simulation Center. Observe and work with expert ultrasound practitioners at clinical sites.

**Requisites:** MED SC-M 810, 811, 812, and 813

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, for 2 number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Describe ultrasound physics and how these physical principles create opportunities, limitations, and artifacts in clinical imaging.

Audience: Graduate

2. Operate ultrasound machines, and acquire and archive different types of ultrasound images (grayscale, color Doppler, and spectral Doppler).

Audience: Graduate

3. Explain anatomy and physiology as presented in ultrasound images.

Audience: Graduate

4. Become proficient in performing and interpreting ultrasound examinations, including basic abdomen, female pelvis, lower extremity arterial/venous, aorta, FAST scan for trauma, basic echocardiography, lung, thyroid/anterior neck, and musculoskeletal (muscle, tendon).

Audience: Graduate

5. Correlate normal and pathologic findings from ultrasound examinations with expected findings from the physical examination. Explain how these techniques complement each other.

Audience: Graduate

6. Identify how ultrasound techniques can be used to solve particular clinical problems.

Audience: Graduate

7. Summarize how the ultrasound examination can be modified to answer unresolved questions.

Audience: Graduate

**RADIOL 913 – AI IN HEALTHCARE: A PRACTICAL INTRODUCTION**

2 credits.

An introduction to the rapidly developing field of artificial intelligence (AI) and its transformative potential in healthcare. Gain a foundational understanding of core AI concepts, including machine learning, deep learning, natural language processing, and multimodal AI. Explore the application of AI in diverse medical specialties, including radiology, pathology, cardiology, and surgery. Examine the ethical and societal implications of AI in clinical practice.

**Requisites:** MED SC-M 810, 811, 812, and 813

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Learning Outcomes:** 1. Describe the core concepts of AI, including machine learning (ML), deep learning (DL), natural language processing (NLP), and multimodal AI.

Audience: Graduate

2. Analyze the applications, potential, and impact of AI in various medical specialties, including radiology, pathology, cardiology, and surgery.

Audience: Graduate

3. Evaluate the ethical and societal implications of AI in healthcare, such as bias, privacy, and the impact on the patient-physician relationship.

Audience: Graduate

4. Appraise the strengths and limitations of AI algorithms in clinical decision-making.

Audience: Graduate

5. Communicate effectively about AI with patients, colleagues, and the public.

Audience: Graduate

6. Assess the public health implications of AI in healthcare, including access, equity, and community impact.

Audience: Graduate

7. Analyze the impact of AI on population health and health disparities, and propose solutions to improve health equity.

Audience: Graduate

**RADIOL 914 – PHYSICIAN FINANCIAL WELLNESS**

1 credit.

Graduating medical students are faced with a wide array of financial planning and wellness challenges. The median medical student debt has continued to increase, and there is a corresponding proliferation of federal repayment and forgiveness options. Other financial planning needs, such as budgeting and insurance, also arise during this time of transition. A unique opportunity to learn key concepts around budgeting, investing, insurance, and negotiation through independent and group learning experiences. This format allows for better analysis on financial decisions and to understand the impact of these decisions on both current and future financial health and wellness.

**Requisites:** MED SC-M 810, 811, 812, and 813

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Define budgeting and its role in the trainees' life  
Audience: Graduate

2. Explore different budgeting techniques

Audience: Graduate

3. Create an income-adjusted and -appropriate budget for both trainees and physicians early in practice

Audience: Graduate

4. Describe how federal income-driven repayment programs work and how they interact with public service loan forgiveness

Audience: Graduate

5. Describe the requirements for public student loan forgiveness

Audience: Graduate

6. Demonstrate awareness of the NIH loan repayment programs for biomedical or biobehavioral research careers

Audience: Graduate

7. Identify the options in loan repayment (IDR and PSLF, refinancing, and forbearance and deferment)

Audience: Graduate

8. Discern the types of insurance relevant to physicians and evaluate best practices for purchasing insurance

Audience: Graduate

9. Explore basic negotiation theory and how it applies to career and salary negotiations

Audience: Graduate

10. Explore the types of retirement savings accounts and their relative utility during different stages in a physician's career

Audience: Graduate

11. Gain an overview on how to plan for financial wellness

Audience: Graduate

12. Apply all the financial tools to real-life scenarios

Audience: Graduate

13. Identify key terms in financial literacy

Audience: Graduate

**RADIOL 920 – DIAGNOSTIC RADIOLOGY ELECTIVE**

2 credits.

Familiarizes the student with the various imaging and therapeutic procedures that are performed in radiology. In addition to learning about the strengths and limitations of different imaging studies, the student should attempt to relate abnormal radiologic findings to pathophysiology with logic and confidence. Students will be given the opportunity to rotate through the section of their choice for 2 weeks in the Radiology department and are able to tailor their reading room experiences to their interests. They will engage in hands on learning activities, interactive assignments, and learn to communicate in interdisciplinary conversations about patient care when it comes to best practices with radiology.

**Requisites:** MED SC-M 810, 811, 812, and 813

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Identify how to apply ACR Appropriateness Criteria to all imaging and treatment decisions  
Audience: Graduate

2. Communicates effectively with the Radiology team and participates in interdisciplinary conversations about patient care

Audience: Graduate

3. Identify core can't miss diagnoses on imaging

Audience: Graduate

4. Counsel hypothetical patients on the details of relevant imaging tests, including descriptions of risks and benefits

Audience: Graduate

**RADIOL 923 – CLINICAL NUCLEAR MEDICINE ELECTIVE**

2 credits.

Work directly with faculty in the Nuclear Medicine section of the Department of Radiology. Broad-based experience in a variety of procedures routinely performed by the nuclear medicine service, including nuclear cardiology. Practice in building and presenting a case report.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Demonstrate knowledge of Nuclear Medicine and the overall role of this specific field in the world of Radiology  
Audience: Graduate

2. Apply knowledge learned to participate in group discussions

Audience: Graduate

3. Complete a case report according to the guidelines laid out under direction the course directors

Audience: Graduate

**RADIOL 924 – GENERAL RADIOLOGY ELECTIVE**

2-4 credits.

Elective opportunity to study basic radiological studies and modalities. Gain proficiency in identifying normal structures and can't miss diagnoses on a chest radiograph and abdominal films as well as determining indications for advanced studies (computed tomography CT, magnetic resonance imaging MRI, ultrasound US, angiograms). Practice in building and presenting a case report.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** Yes, unlimited number of completions

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Demonstrate knowledge of basic radiologic studies and modalities and pathology presentation within those studies  
Audience: Graduate

2. Apply knowledge learned to participate in diagnostic workup of radiologic images  
Audience: Graduate

3. Complete a case report according to the guidelines laid out under direction the course directors  
Audience: Graduate

**RADIOL 926 – INTERVENTIONAL RADIOLOGY ELECTIVE**

2-4 credits.

High-level procedural experience on a clinical interventional radiology service. Interventional radiology uniquely blends the concepts of imaging anatomy and pathophysiology to provide minimally invasive solutions to patients. Hone clinical and procedural skills while being exposed to a rich background curriculum with the goal of case report publication.

**Requisites:** Graduate/professional standing

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Recognize indications and contraindications for basic IR procedures.  
Audience: Graduate

2. Demonstrate interventional radiology table management skills.  
Audience: Graduate

3. Perform basic steps needed to obtain central venous access.  
Audience: Graduate

4. Describe basics of conscious sedation including reversal medications and doses  
Audience: Graduate

5. Demonstrate how to obtain informed consent.  
Audience: Graduate

6. Practice skills needed for manuscript submission, review, and discussion.  
Audience: Graduate

**RADIOL 928 – SCREENING IN RADIOLOGY**

2 credits.

Clinical experience on diagnostic radiology service. Apply population health and epidemiology principles to screening exam selection in radiology. Participate in interdisciplinary conversations surrounding patient care. Practice in patient-centered communication and in creating a case report.

**Requisites:** MED SC-M 810, 812, 813, and 911

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Repeatable for Credit:** No

**Last Taught:** Spring 2026

**Learning Outcomes:** 1. Define and describe the basic elements of a screening test

Audience: Graduate

2. Explain common misconceptions of screening tests and epidemiology

Audience: Graduate

3. Present factors that explain varying rates of screening in different countries and factors that influence decision-making in these regions

Audience: Graduate

4. List the pros and cons of different screening options and compare them to those for invasive alternatives

Audience: Graduate

5. Explain the advantages and disadvantages of screening outcomes to a hypothetical patient

Audience: Graduate

6. Predict and explain potential outcomes and associated next steps after screening to a hypothetical patient

Audience: Graduate

7. Determine the actual costs of screening to patients based on insurance coverage or lack thereof

Audience: Graduate

8. Describe potential sources of bias in screening tests including lead time bias, length time bias, and selection bias. Explain how appropriate study design for screening program evaluation can overcome these sources of bias.

Audience: Graduate

9. Calculate and define sensitivity, specificity, positive predictive value, and negative predictive value of a screening test. Describe how these values will or will not be altered as the disease prevalence changes.

Audience: Graduate

10. Discuss an example of healthcare disparities related to imaging screening

Audience: Graduate