



# MRI POST-PRIMARY CERTIFICATION



Penn State Schuylkill is pleased to offer an MRI Post-Primary Certification in partnership with ImagingU. This certification is designed to provide the technologist with the theory and structured education requirements to apply for ARRT (American Registry of Radiologic Technologists) certification and registration under the post-primary eligibility pathway for Magnetic Resonance Imaging.

[> LEARN MORE & REGISTER TODAY](#)



[sl.psu.edu/continuing-education/professional-development/mri](https://sl.psu.edu/continuing-education/professional-development/mri)

## REQUIRED COURSES & 2024-25 SCHEDULE

### FALL 2024

September 2 – December 20, 2024

#### **MRI POST-PRIMARY THEORY I (RADSC 5000)**

11.5 CEUs, 8 modules

(approximately 7-8 hours per week)

Delivery: Online, asynchronous with a facilitator

#### **MRI POST-PRIMARY CLINICAL I (RADSC 5000C)**

24 CEUs, 16 hours per week

must be taken in conjunction with RADSC 5000)

Delivery: In-person at an assigned health care facility

### SPRING 2025

January 13 – May 9, 2025

#### **MRI POST-PRIMARY THEORY II (RADSC 5001)**

12.5 CEUs, 9 modules (approximately 8-9 hours per week)

Delivery: Online, asynchronous with a facilitator

#### **MRI POST-PRIMARY CLINICAL II (RADSC 5001C)**

24 CEUs, 16 hours per week

must be taken in conjunction with RADSC 5001)

Delivery: In-person at an assigned health care facility

**PREREQUISITES:** Must have completed a Radiologic Technologist Degree



## FACULTY

### Class Facilitator:

Monica Weiser  
MRI technologist at St. Luke's Miners Campus

### Clinical Coordinator:

Hilary Yotko  
Lecturer and program coordinator of radiological sciences at Penn State Schuylkill



## INVESTMENT

- \$750 per course (\$3,000 total for all four courses)
- Participants are responsible all fees associated with obtaining pre-clinical requirements.



Reach out to Laura M. Kramer, coordinator of continuing education and workforce development with any questions or to obtain more information at [lmk6218@psu.edu](mailto:lmk6218@psu.edu) or **570-385-6112**.



## PRE-CLINICAL REQUIREMENTS

Child abuse clearance, criminal background checks, medical tests, and other preclinical documents are required by all clinical education centers prior to beginning their clinical courses.

Participants must obtain background checks and record all required medical tests and other documents through **CastleBranch.com**. The clinical coordinator will advise participants on the procedure to follow in submitting their background checks, medical tests and other preclinical documents to CastleBranch.com upon registering for the course.

Participants are responsible for all fees associated with the medical tests, child abuse, and criminal background checks and other preclinical requirements. Clinical education centers, in agreement with the Radiologic Science program, also have the right to request random drug testing and other tests on participants being assigned at their facility. Clinical education centers have the right to deny a participant's placement to their facilities if a criminal record, positive drug test, or other clinical site requirements are not in compliance.

## ImagingU

MRI Post-Primary Theory I & II use online curriculum by ImagingU. ImagingU is an online platform that provides Online Courses, Test Prep, and CEs for MRI Post-Primary Pathway Cert, MRI Safety, & More. Course description provided by ImagingU:

- This course fulfills the post primary pathway requirements set forth by the American Registry of Radiologic Technologists for 2016 and beyond.
- The course is separated into modules that are designed not only to help you accomplish your goal of successfully passing the MRI registry but also to provide you with a strong foundation to excel within the field of MRI itself.
- This course was developed by Imaging technologists, PhD Scientists, and Radiologists. It was specifically designed for the MRI technologist with the goal of eliminating the mystery behind MRI physics and improving clinical methods and practices.
- To maximize understanding and retention of key concepts, this course utilizes a comprehensive set of animations, instructional videos, figures, analogies, and explanations. In addition, we offer various test preparation modes to improve confidence and give you practice in taking the MRI registry. Course progress and user comprehension are tracked automatically and readily available in the user's dashboard. This allows the user to identify strengths and target weaknesses before taking the exam. All of this combined provides an educational experience that is tailored to the user's individual learning style.

## COURSE DESCRIPTIONS

### MRI POST-PRIMARY THEORY I

This course is designed to provide the technologist with the theory and structured education requirements to apply for ARRT certification and registration under the post-primary eligibility pathway for Magnetic Resonance Imaging. The first eight modules in the series will be completed in this course. After successful completion of the quiz at the end of each module the student will earn 1 to 2.5 category A Continuing Education (CE) credit(s) for a total of 11.5 CEs. All course content is classified under Image Production for ARRT post-primary structured education requirement.

#### Objectives

1. Explain the physical principles and fundamentals that are utilized in order to create an MRI image. This includes magnetism, precession, resonance Larmor equation, and Faraday's law.
2. Understand how atomic particles interact when in a magnetic field.
3. Describe the instrumentation necessary for MRI, including types of magnets, MRI scanner components, magnetic field, radiofrequency system, gradient system, and coils.
4. Explain MRI image contrast mechanisms and tissue characteristics. This includes T1 relaxation, T2 relaxation, T2\* (susceptibility), and proton density.
5. Describe the basic foundation of the pulse sequences used in MRI, including echo formation, pulse sequence diagrams, spin echo, fast spin echo, gradient echo, spoiled gradient echo, and coherent gradient echo.
6. Explain the major topics of pulse sequences, including inversion recovery, echo planar imaging (EPI), spectral saturation, spatial saturation, magnetization preparation, k-space, k-space filling techniques, image reconstruction, and parallel imaging techniques.
7. Discuss what makes up an MRI image and how it is created. This includes the functions of gradients and the role that they play in slice, phase, and frequency encoding; the MRI signal, where it comes from, and complex sine waves; fast Fourier transformation; and k-space.
8. Discuss imaging parameters and their relationships regarding signal-to-noise ratio, scan time, and spatial resolution.
9. Explain the parameters of echo time, repetition time, echo train length, bandwidth, and field of view.
10. Describe how to calculate scan time.
11. Discuss image resolution.

### MRI POST-PRIMARY CLINICAL I

This course is designed to provide the technologist with supervised clinical experience to apply for ARRT certification and registration under the post-primary eligibility pathway for Magnetic Resonance Imaging. The ARRT clinical experience requirements for Magnetic Resonance Imaging will guide the clinical experience. Instruction will emphasize screening and safety, pathology, imaging protocols and procedures, image evaluation, quality control, patient care and contrast media use and preparation explicit to MRI scanning.

#### Objectives

1. communicate properly with patients, staff, technologists, and physicians
2. report any abnormal incident to registered technologist (pertaining to equipment, patients, and self)
3. function as a team member and be respectful of others in a professional manner
4. complete requirements set by the ARRT MRI Clinical Experience requirements (follow Specific MRI Imaging Procedure Requirements, complete MRI safety requirements, follow general guidelines for MRI procedures, perform MRI QC procedures)
5. complete image evaluation
6. perform the proper positioning and scanning protocols for MRI procedures required by the ARRT
7. identify normal and abnormal cross-sectional anatomy in the axial, coronal and sagittal planes
8. demonstrate competence in patient care principles including MRI screening and safety
9. prove competent in venipuncture

## MRI POST-PRIMARY THEORY II

This course is designed to provide the technologist with the theory and structured education requirements to apply for ARRT certification and registration under the post-primary eligibility pathway for Magnetic Resonance Imaging. Modules 9-17 in the series will be completed in this course. After successful completion of the quiz at the end of each module the student will earn 1 to 2 category A Continuing Education (CE) credit(s) for a total of 12.5 CEs. Course content is classified under Safety, Image Production, Patient Care, and Procedures for ARRT post-primary structured education requirements.

### Objectives

1. Discuss safety in and around the MRI scanner as well as the forces and factors that contribute to the need for safe practices and procedures in MRI.
2. Explain the proper classification of the MRI zones and personnel along with identification of causes of static magnetic field, radiofrequency, and gradient injuries.
3. Describe MRI contrast agents and mechanisms, including type of agent (FDA approved), contraindications, dose calculation, administration route, and effects on image.
4. Explain MRI vascular imaging techniques and underlying flow concepts. Include magnetic resonance angiography (MRA), magnetic resonance venography (MRV), time-of-flight, flow dynamics, phase contrast, and contrast enhanced.
5. Discuss the appearance of common MRI artifacts including their underlying cause and how to minimize them. Common artifacts are aliasing, truncation, chemical shift, magnetic susceptibility, zipper, motion, partial volume averaging, cross-talk, and Moire.
6. Discuss legal concepts of the medical professional and legal terminology.
7. Describe patient care practices and procedures to have a clear understanding on best practices. Include the ARRT code of ethics, patient bill of rights, and communicating with the patient.
8. Explain scanning procedures for the central nervous system and surrounding structures. Proper patient setup, coil selection, imaging planes, and protocol considerations should be detailed. Also include relevant anatomy, physiology, and pathology for brain, neck, and spine exams.
9. Explain scanning procedures for musculoskeletal applications. Proper patient setup, coil selection, imaging planes, and protocol considerations should be detailed. Also include relevant anatomy, physiology, and pathology for shoulder, elbow, wrist, hip, knee, ankle, and foot musculoskeletal exams.
10. Explain scanning procedures for thorax, abdomen, and pelvis applications. Proper patient setup,

## MRI POST-PRIMARY CLINICAL II

This course is designed to provide the technologist with supervised clinical experience to apply for ARRT certification and registration under the post-primary eligibility pathway for Magnetic Resonance Imaging. The ARRT clinical experience requirements for Magnetic Resonance Imaging will guide the clinical experience. Instruction will emphasize screening and safety, pathology, imaging protocols and procedures, image evaluation, quality control, patient care and contrast media use and preparation explicit to MRI scanning. Students should have all requirements completed at the end of this course.

### Objectives

1. communicate properly with patients, staff, technologists, and physicians
2. report any abnormal incident to registered technologist (pertaining to equipment, patients, and self)
3. function as a team member and be respectful of others in a professional manner
4. complete requirements set by the ARRT MRI Clinical Experience requirements (follow Specific MRI Imaging Procedure Requirements, complete MRI safety requirements, follow general guidelines for MRI procedures, perform MRI QC procedures)
5. complete image evaluation
6. perform the proper positioning and scanning protocols for MRI procedures required by the ARRT
7. identify normal and abnormal cross-sectional anatomy in the axial, coronal and sagittal planes
8. demonstrate competence in patient care principles including MRI screening and safety



## CLINICAL LOGISTICS

### Per ARRT

- ARRT limits the number of clinical experience entries you can report each day. For MRI there is a maximum of seven entries per day. Clinical experience entries include both the different procedures you perform and the number of repetitions you perform of each procedure. Remember: we're limiting only the number of entries you can report per day, not the number you can perform.
- Procedures are documented, verified, and submitted when complete via an online tool accessible through My ARRT Info account on [artt.org](http://artt.org). ARRT encourages individuals to obtain education and experience beyond these minimum requirements. Completion of each procedure must be verified by an ARRT certified and registered technologist (post-primary certification not required) or an interpreting physician. The verification process is described within the online tool.

### Clinical Supervision

Students will be directly supervised by MRI technologists while in clinical. The technologists can check off clinical experiences. An ARRT validator is required at each site to complete the final sign off. Students will be made aware of the validators at the sites.

### Clinical Site Placement

Clinical site placement will be discussed with the student at the start of the semester. It will most likely be based on where the student works or lives. It is beneficial for the student to get a well-rounded clinical experience. Whenever possible, the student will rotate to two different hospital systems. Students may also rotate to different locations within a system. The rotation schedule will be made at the start of the semester.

## WedNet - FUNDING FOR EMPLOYERS

- Created by the Department of Community & Economic Development — DCED — and made available through the Workforce and Economic Development Network of Pennsylvania — WEDnetPA — this program provides qualified employers training for new and existing employees.
- Eligible in-state businesses and out-of-state companies relocating to Pennsylvania apply to WEDnetPA to access training funds. The funding, in turn, can be used for a wide range of training topics.
- Local WedNet partner – LCCC – Maureen Donovan – [mdonovan@lccc.edu](mailto:mdonovan@lccc.edu)



Reach out to Laura M. Kramer, coordinator of continuing education and workforce development with any questions or to obtain more information at [lmk6218@psu.edu](mailto:lmk6218@psu.edu) or 570-385-6112.

 **LEARN MORE & REGISTER TODAY**



[sl.psu.edu/continuing-education/professional-development/mri](https://sl.psu.edu/continuing-education/professional-development/mri)