

MEDICAL IMAGING

Contacts: Debby Moore, M.S., RT(R)(CT)(ARRT), Program Director

Website: <http://www.marshall.edu/cohp> (<http://www.marshall.edu/cohp/>)

The Bachelor of Science in Medical Imaging is a cooperative program between St. Mary's Medical Center School of Medical Imaging (SOMI) and Marshall University that will prepare the student for professional employment as a radiographer or sonographer. Graduates of the program are eligible to take either the primary certification in radiography administered by American Registry of Radiologic Technologists (ARRT) or sit for the Diagnostic Medical Sonography or Vascular Sonography exam administered by the American Registry of Diagnostic Medical Sonographers. In addition, graduates in the radiography track will be academically prepared to sit for a post-primary certification in an advanced imaging modality.

Graduates must complete all university graduation requirements prior to sitting for the ARRT or ARDMS exam. Due to the time-sensitive nature of the clinical requirements of the certification exams, students must complete all degree requirements within 36 months of entering the SOMI. This does not include the Year One coursework completed at Marshall University.

- Year One focuses on general education requirements and program-specific prerequisites.
- Year 2 focuses on basic medical imaging.
- Students select the radiography track or sonography track in Year 3. Sonography will have a limited number of students and admission will be selective.
- Year 4 will be advanced imaging modalities in either radiography or sonography.

Students are expected to complete all requirements of the SOMI as well as graduation requirements of the university within four (4) years.

Accreditations

- The Bachelor of Science in Medical Imaging Radiography program is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT), 20 N. Wacker Drive, Suite 2850, Chicago, IL 60606-3182, phone 312-704-5300, status: 8 year accreditation (maximum offered). It is also accredited by the West Virginia Medical Imaging and Radiation Therapy Technology Board of Examiners. 1715 Flat Top Road, PO BOX 638, Cool Ridge, WV 25825, phone 304-787-4398.
- The sonography program is accredited by The Joint Review Commission in Diagnostic Medical Sonography, www.jrcdms.org (<http://www.jrcdms.org>) and the Commission on Accreditation of Allied Health Programs; <http://www.caahep.org/>.

Tuition Assistance Program

The Marshall University Employee Dependent Undergraduate Tuition Assistance Program cannot be used to cover the tuition and fees of the St. Mary's/Marshall University cooperative programs, which include medical imaging, nursing, and respiratory care. These programs are classified as third-party waiver programs, which are exempted from the Employee Dependent Tuition Assistance Program.

Medical Imaging Professional-Level Completion Program

Applicants with ARRT certification in Radiography, Nuclear Medicine or Radiation Therapy, or ARDMS certification in sonography, may apply for admission into the Professional component to complete the criteria for one of the specialization tracks and to earn a Bachelor of Science – Medical Imaging degree. The completion program uses a 2+2 ladder concept.

Admission requirements include:

1. Demonstration of professional credentials
2. Completion of graduation requirements. Students whose radiography coursework or other coursework was not completed at SMMC SOMI/Marshall University, will be required to satisfy the general education graduation requirements prior to enrolling in the MI program.

This will vary depending upon the applicant's prior college coursework. Each applicant will be considered on an individual basis. Applicant will receive 55 credit hours for their prior radiology education. Applicants will use the independent study option to raise their imaging coursework to the credit hour level of the SMMC SOMI student (year 2-3). The particular course of the independent study will be determined between the student and the program director.

Programs

- Medical Imaging Radiography, B.S. (<http://catalog.marshall.edu/undergraduate/programs-az/health-professions/medical-imaging/medical-imaging-radiography-bs/>)

Courses

 - General Education Course

MI 201 Intro to Radiography 3 Credit hours

Provides an overview of the foundations in radiography and the practitioner's role in the health care delivery system and professional responsibilities of the radiographer.

Pre-req: BSC 228 and MTH 121 and PHY 101.

Grade Mode: Normal Grading Mode

MI 202 Patient Care Img Science 3 Credit hours

Content is designed to identify the role of the radiographer in patient care, including consideration for the physical and psychological needs of the patient and family.

Pre-req: BSC 228 and MI 201.

Co-req: MI 203, MI 204, MI 205, MI 206

Grade Mode: Normal Grading Mode

MI 204 Radiographic Anatomy 3 Credit hours

Content is designed to introduce the student to radiographic anatomy. Emphasis is placed on identifying structures visible on correctly performed radiographic procedures.

Pre-req: BSC 228.

Co-req: MI 202, MI 203, MI 205, MI 206

Grade Mode: Normal Grading Mode

<p>MI 205 Imaging Procedures I 4 Credit hours Content is designed to provide the knowledge base necessary to perform standard imaging procedures. Students will practice imaging procedures in lab prior to performing them on patients. Pre-req: BSC 228. Co-req: MI 202, MI 203, MI 204, MI 206 Grade Mode: Normal Grading Mode</p>	<p>MI 302 Princ of Radiation Physics 3 Credit hours Introduces student to the nature and characteristic of radiation production and the fundamentals of photon interactions with matter. Course covers principles associated with radiography, nuclear medicine and radiation oncology. Pre-req: PHY 101 and PHY 101L and MTH 121 and MI 209. Co-req: MI 303, MI 304, MI 305, MI 306 Grade Mode: Normal Grading Mode</p>
<p>MI 206 Clinical Practice I 4 Credit hours Content and clinical practice experiences are designed to sequentially develop, apply, critically analyze, integrate, synthesize and evaluate concepts and theories in the performance of radiologic procedures. Co-req: MI 202, MI 203, MI 204, MI 205 Grade Mode: Normal Grading Mode</p>	<p>MI 303 Image Acquisition 3 Credit hours Introduces students to the factors that govern the image production process. Pre-req: MTH 121 and MI 209. Co-req: MI 302, MI 304, MI 305, MI 306 Grade Mode: Normal Grading Mode</p>
<p>MI 207 Imaging Procedures II 4 Credit hours Content is designed to provide the knowledge base necessary to perform special imaging procedures and basic computed tomography. Pre-req: BSC 228 with a minimum grade of D and MI 206 with a minimum grade of D. Co-req: MI 208, MI 209, MI 210, MI 211 Grade Mode: Normal Grading Mode</p>	<p>MI 304 Radiographic Pathology 3 Credit hours Introduces student to concepts related to disease and etiological considerations with emphasis on radiographic appearance of disease and impact on exposure factor selection. Pre-req: BSC 228 with a minimum grade of D and MI 204 with a minimum grade of D. Co-req: MI 302, MI 303, MI 305, MI 306 Grade Mode: Normal Grading Mode</p>
<p>MI 208 Pharmacology for Imaging Sci 2 Credit hours Content is designed to provide basic concepts of pharmacology including delivery of and pharmacodynamics associated with imaging contrast media. Pre-req: BSC 227 with a minimum grade of D and MI 206 with a minimum grade of D. Co-req: MI 207, MI 209, MI 210, MI 211 Grade Mode: Normal Grading Mode</p>	<p>MI 305 Clinical Practice IV 4 Credit hours Content is designed to provide the knowledge base necessary to perform standard imaging procedures. Clinical practice is sequential. Students will be introduced to special imaging modalities. Pre-req: MI 301. Co-req: MI 302, MI 303, MI 304, MI 306 Grade Mode: Normal Grading Mode</p>
<p>MI 209 Intro to Imaging Equip 3 Credit hours Content is designed to provide knowledge in radiographic, fluoroscopic, mobile and tomographic equipment requirements and design. Pre-req: MTH 121 with a minimum grade of D and PHY 101 with a minimum grade of D and PHY 101L with a minimum grade of D. Co-req: MI 207, MI 208, MI 210, MI 211 Grade Mode: Normal Grading Mode</p>	<p>MI 306 Seminar Imaging Science 1 Credit hour Introduces student to current research in imaging science. Co-req: MI 302, MI 303, MI 304, MI 305 Grade Mode: Normal Grading Mode</p>
<p>MI 210 Clinical Practice II 4 Credit hours Content is designed to provide the knowledge base necessary to perform standard imaging procedures. Students will begin clinical rotations in computed tomography. Pre-req: MI 206 with a minimum grade of D. Co-req: MI 207, MI 208, MI 209, MI 211 Grade Mode: Normal Grading Mode</p>	<p>MI 307 Radiobiology 3 Credit hours This course focuses on the biological impact of ionizing radiation. Pre-req: BSC 228 and CHM 203 and MI 302. Co-req: MI 308, MI 309, MI 310 Grade Mode: Normal Grading Mode</p>
<p>MI 211 Seminar Imaging Science 1 Credit hour Introduces student to current research in imaging science. Emphasis will be on oral communication via power point presentations. Co-req: MI 207, MI 208, MI 209, MI 210 Grade Mode: Normal Grading Mode</p>	<p>MI 308 Rad Image Analysis 2 Credit hours Content is designed to provide a basis for analyzing and critiquing radiographic images. Pre-req: MI 303 with a minimum grade of D and MI 304 with a minimum grade of D and MI 208 with a minimum grade of D. Co-req: MI 307, MI 309, MI 310 Grade Mode: Normal Grading Mode</p>
<p>MI 212 Seminar Imaging Sciences II 1 Credit hour Seminar on new and emerging technologies in imaging sciences. Grade Mode: Normal Grading Mode</p>	<p>MI 309 Digital Image Acquisition 2 Credit hours Content is designed to impart an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiography. Pre-req: MI 303 with a minimum grade of D. Co-req: MI 305, MI 307, MI 310 Grade Mode: Normal Grading Mode</p>
<p>MI 213 Elective Clinical Practicum I 4 Credit hours Elective clinical practicum in radiography or sonography. Grade Mode: Normal Grading Mode</p>	
<p>MI 214 Intro to Sonography 3 Credit hours This course introduces the basic principles of sonography. Grade Mode: Normal Grading Mode</p>	

MI 310 Clinical Practice V	4 Credit hours	MI 321 Imaging Procedures III	4 Credit hours
Content is designed to provide the knowledge base necessary to perform standard imaging procedures. Clinical practice is sequential. Students will be introduced to special imaging modalities.		Content is designed to provide the knowledge necessary for advanced diagnostic radiographic imaging procedures.	
Pre-req: MI 210 with a minimum grade of D and MI 301 with a minimum grade of D and MI 305 with a minimum grade of D.		Pre-req: MI 205 and MI 207.	
Co-req: MI 307, MI 308, MI 309		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 322 Radiation Safety	3 Credit hours
MI 311 Seminar Imaging Sciences III	1 Credit hour	This course focuses on radiation safety including ionizing radiation dose limits for the occupational worker, patient and general public.	
Seminar on new and emerging technologies in imaging sciences.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 401 Seminar in Imaging Sci	1 Credit hour
MI 312 Abdominal Sonography I	4 Credit hours	Review seminar for the primary ARRT certification examination.	
This course covers basic abdominal sonographic positioning and scanning protocols, as it relates to normal anatomy of the abdomen. Laboratory included.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 402 Quality Management	3 Credit hours
MI 313 Ultrasound Physics I	3 Credit hours	Advanced practice course in the quality assurance (QA) and quality management (QM) process for imaging sciences.	
The focus of this course is to educate students about the physics of sound waves and their interaction with tissue enabling the display of diagnostic imaging.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 403 Adv Practice Medical Img	3 Credit hours
MI 314 Clinical Practice I Sonography	4 Credit hours	Core theory requirement for all advanced practice students focused on discussion of communication, human diversity, health care policy, legal issues and patient information management.	
Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 404 Adv Sectional Anatomy	3 Credit hours
MI 315 Small Parts Sonography	3 Credit hours	Provides students enrolled in CT/MRI advanced practice track advanced knowledge of sectional anatomy.	
This course covers anatomy, positioning and scanning protocol of the superficial structures.		Co-req: MI 405, MI 407	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
MI 316 Abdominal Sonography II	3 Credit hours	MI 405 CT Procedures	3 Credit hours
This course covers basic abdominal sonographic positioning and scanning protocols, as it relates to normal anatomy, anatomical variants, physiology to include the retroperitoneum, associated abdominal vasculature identified.		Focus on advanced patient care skills including ACLS, imaging procedures and equipment in computed tomography.	
Grade Mode: Normal Grading Mode		Co-req: MI 404, MI 408	
MI 317 Ultrasound Physics II	3 Credit hours	Grade Mode: Normal Grading Mode	
The focus of this course is to educate students about the physics of sound waves and their interaction with tissue enabling the display of diagnostic imaging.		MI 406 MRI Procedures	3 Credit hours
Grade Mode: Normal Grading Mode		Focus on advanced patient care skills including ACLS, imaging procedures and equipment in computed tomography.	
MI 318 Vascular Sonography I	4 Credit hours	Co-req: MI 404, MI 408	
Discussion of vascular disease, duplex examinations with comparison to arteriography, as it pertains to venous and visceral vascular examinations. Laboratory included.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 407 Cardiovascular Anatomy	3 Credit hours
MI 319 Clinical Prac II Sonography	4 Credit hours	Focus on advanced cardiovascular anatomy, physiology and pathophysiology including heart anatomy, coronary, systemic, pulmonary, peripheral and cerebral circulation.	
Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures.		Co-req: MI 408	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
MI 320 Elective Clinical Practicum II	4 Credit hours	MI 408 Vascular Interventional Img	3 Credit hours
Elective clinical practicum in radiography or sonography.		Focus is on advanced patient care skills including ACLS, procedures and equipment utilized in cardiovascular and vascular/interventional imaging.	
Grade Mode: Normal Grading Mode		Co-req: MI 407	
		Grade Mode: Normal Grading Mode	
		MI 409 Adv Clinical Practice	4 Credit hours
		Students will arrange clinical experience in selected imaging modality to gain competency in clinical procedures required to sit for post-primary ARRT certification exams.	
		Grade Mode: Normal Grading Mode	
		MI 410 🌱 Research Medical Imaging	3 Credit hours
		Capstone course. Research methods and information literacy.	
		Attributes: Capstone Course	
		Grade Mode: Normal Grading Mode	

MI 411 🌍 Transcultural Healthcare	3 Credit hours	MI 423 Echocardiography I	4 Credit hours
Multidisciplinary approach to transcultural healthcare. Course will utilize comparative ethnography and provide a theoretical framework for organizing and interpreting information about health.		This course covers basic adult heart sonographic positioning and scanning protocols, as it relates to normal anatomy, anatomical variants, physiology of the adult heart.	
Attributes: Multicultural		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 424 Vascular Sonography II	3 Credit hours
MI 412 Radiography Management I	3 Credit hours	Discussion of vascular pathology and the use of plethysmography techniques in sonography.	
Provides instruction in management principles for radiography departmental managers including JACHO and Nuclear Regulatory Commission parameters. Students will be prepared to sit for the certification exam offered by the AHRA.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 425 Echocardiography II	3 Credit hours
MI 413 Radiography Management II	3 Credit hours	This course is a continuation of MI 423 and covers basic adult heart sonographic positioning and scanning protocols, as it relates to anatomical variants and physiology of the adult heart.	
Continuation of MI 412 to provide radiographer with management principles and preparation for the AHRA certification exam in radiography management.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 426 Advanced Clinical Practice II	4 Credit hours
MI 414 Mammography	3 Credit hours	Students will arrange clinical experience in selected imaging modality to gain competency in clinical procedures required to sit for post-primary ARRT certification exams.	
Introduction to medical imaging of the breast. Focus is to prepare student for advanced certification exam in Mammography.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 427 Adv Trauma and Surgical Rad	3 Credit hours
MI 415 RIS and PACS Principles	3 Credit hours	Advanced practice course in trauma and surgical radiography for imaging sciences.	
Course content provides basic knowledge of digital storage systems, computer networking, radiology information systems (RIS), and picture archiving and communication systems (PACS).		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 428 Forensic Radiology	3 Credit hours
MI 416 Obstetrical Sonography I	3 Credit hours	This course will focus on introducing forensic radiography techniques and theoretical models.	
This course covers basic obstetrical sonographic positioning and scanning protocols, as it relates to normal anatomy of the fetus.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 429 Geriatric and Pediatric Rad	3 Credit hours
MI 417 Gynecological Sonography I	3 Credit hours	This course will focus on advanced diagnostic medical imaging in the geriatric and pediatric population including mobile radiography.	
This course presents a study of normal anatomy and physiology of the nongravid and first trimester pelvis.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 430 Mammography II	3 Credit hours
MI 418 Sonography Registry Review I	1 Credit hour	Advanced medical imaging of the breast.	
This course is designed to prepare the sonography student for their first specialty exam through the ARDMS.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 431 Adv Clinical Practice III	4 Credit hours
MI 419 Clinical Prac III Sonography	4 Credit hours	Elective advanced clinical practicum in radiography or sonography.	
Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures.		Grade Mode: Normal Grading Mode	
Grade Mode: Normal Grading Mode		MI 432 Advanced MRI Theory	3 Credit hours
MI 420 Obstetrical Sonography II	2 Credit hours	Advanced magnetic resonance imaging equipment and procedures.	
This course focuses on sonographic techniques in high risk pregnancies and fetal abnormalities.		Pre-req: MI 406 with a minimum grade of D.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
MI 421 Gynecological Sonography II	2 Credit hours	MI 433 Point of Care Ultrasound	3 Credit hours
This course presents a study of pathology of the nongravid and first trimester pelvis.		This course will introduce basic principles of point of care ultrasound for vascular and cardiac interventional radiography, and mammography.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
MI 422 Clinical Pract IV Sonography	4 Credit hours	MI 434 Cardiovascular Imaging	3 Credit hours
Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures.		This course will focus on diagnostic and interventional procedures of the cardiovascular system.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
MI 423 Echocardiography I	4 Credit hours	MI 435 Seminar ARRT Exam Review II	1 Credit hour
This course covers basic adult heart sonographic positioning and scanning protocols, as it relates to normal anatomy, anatomical variants, physiology of the adult heart.		This is a review course for the ARRT primary certification examination.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	
MI 424 Vascular Sonography II	3 Credit hours	MI 436 Sonography Registry Review II	1 Credit hour
Discussion of vascular pathology and the use of plethysmography techniques in sonography.		This course is designed to prepare the sonography student for their second specialty exam through the ARDMS.	
Grade Mode: Normal Grading Mode		Grade Mode: Normal Grading Mode	

MI 437 Breast Sonography 3 Credit hours

This course covers anatomy, positioning and scanning protocol for the breast as well as an introduction to ultrasound physics.

Grade Mode: Normal Grading Mode

MI 438 Fetal Echocardiology 3 Credit hours

This course focuses on echosonography of the developing fetus.

Grade Mode: Normal Grading Mode

MI 439 Pediatric Echo I 3 Credit hours

This course focuses on sonographic techniques in pediatric echocardiography.

Grade Mode: Normal Grading Mode

MI 440 Pediatric Echo II 3 Credit hours

This course is a continuation of MI 439 and focuses on sonographic techniques in pediatric echocardiography.

Pre-req: MI 439 with a minimum grade of D.

Grade Mode: Normal Grading Mode

MI 441 Adv Echocardiography I 3 Credit hours

This course focuses on advanced sonographic techniques in pediatric echocardiography and is designed for the credentialed echocardiographer training in the area of pediatric echo.

Grade Mode: Normal Grading Mode

MI 442 Adv Echocardiography II 3 Credit hours

This course is a continuation of MI 441 and focuses on advanced sonographic techniques in pediatric echocardiography and is designed for the credentialed echocardiographer training in the area of pediatric echo.

Pre-req: MI 441 with a minimum grade of D.

Grade Mode: Normal Grading Mode

MI 485 Independent Study 1-4 Credit hours

Course designed to allow student to pursue individual research in medical imaging.

Grade Mode: Normal Grading Mode

MI 486 Independent Study 1-4 Credit hours

Course designed to allow student to pursue individual research in medical imaging.

Grade Mode: Normal Grading Mode

MI 487 Independent Study 1-4 Credit hours

Course designed to allow student to pursue individual research in medical imaging.

Grade Mode: Normal Grading Mode

MI 488 Independent Study 1-4 Credit hours

Course designed to allow student to pursue individual research in medical imaging.

Grade Mode: Normal Grading Mode

Faculty

Debby Moore, M.S., RT(R) (CT) (ARRT), Department Chair of Medical Imaging

Jane Mannon, M.S., RDMS, RVT, RT (R), Sonography Program Director