



**The Johns Hopkins Hospital  
Schools of Medical Imaging**

**2020-2022**

Sponsored by

The Russell H. Morgan Department of Radiology and Radiologic Sciences  
of

The Johns Hopkins Hospital

The Johns Hopkins Hospital  
Schools of Medical Imaging

Sponsor Address

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Schools of Medical Imaging  
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### **Statement Regarding the Privacy Rights of Students**

The Johns Hopkins Hospital Schools of Medical Imaging are prepared to comply with the provisions of the Families Educational Rights and Privacy Act of 1974 (Public Law 90-247, as amended) and any regulations that may be promulgated there under. Students and others who may wish specific information regarding the rights of access to institutional educational records maintained in their names are advised to contact the Program Director.

### **Notice of Nondiscriminatory Policy as to Students**

The Johns Hopkins Hospital Schools of Medical Imaging does not discriminate against any person on the basis of race, color, national origin, age, sex, sexual orientation, gender identity, religion, disability, veteran status or any other basis protected by law with respect to any of the rights, privileges, program benefits and activities generally afforded or made available to students at the Schools of Medical Imaging.

Certified to be true and correct of content:

Sandra E. Moore

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April 1, 2020

## **History**

The Johns Hopkins Medical Institutions were established through a gift of a Quaker merchant, Johns Hopkins, who wanted the Hospital and University built as a joint venture.

Johns Hopkins was born into a very poor family in southern Maryland in 1795. His first name was inherited from his great-great-grandfather, Richard Johns. Because of the family's financial troubles, he was forced to quit school at the age of 12. He went to work for his uncles and by the age of 19 he had established himself as a respected merchant.

Eventually he went into business for himself and built a fortune of 7 million dollars before he died in 1873 at the age of 78. Hopkins never married but gave much thought to what would happen to his estate. He left 3.5 million dollars to build a hospital, for he said, "There will always be suffering." He also left 3.5 million dollars to build a joint university, "for there will always be youth." His concept of the Hospital and the University as a joint venture was a revolutionary idea at the time that set the standard for future medical education in the United States.

In his will he specified that the Hospital was "forever to serve the sick and ill of Baltimore without regard to race, age, sex or the ability to pay." Drs. Welch and Osler, two of the famous "Hopkins Four", brought other philosophies into the pattern of medical education in patient centered medical training and scientific research. Before the Hospital was established, physicians trained at medical schools without ever examining a real patient. The pattern established at The Johns Hopkins Hospital changed U.S. medical education forever by bringing medical students to the bedside of patients and placing the practice of medicine on a scientific basis.

The Johns Hopkins Hospital opened on May 7, 1898 followed four years later by The Johns Hopkins University along with the School of Medicine. The opening of the University and the School of Medicine ushered in a new era of medicine. Moving from laboratory to lecture hall to the patient's bedside, students and interns brought the scientific approach to medicine and received first-hand training in diagnosis and treatment. Within two decades, the Hospital and School of Medicine were models of medical care and education for the nation. That distinction has remained intact for over 100 years.

Johns Hopkins willed 13 acres of land in the city of Baltimore to erect the Hospital and wanted it to ultimately receive 400 patients. Today, The Johns Hopkins Medical Institutions covers a 44 acre area, has more than 1,000 beds, and is recognized as one of the world's leading medical institutions.

## **Mission of The Johns Hopkins Hospital**

The mission of The Johns Hopkins Hospital is to improve the health of our community and the world by setting the standard of excellence in patient care. Specifically, we aim:

- To be the world's preeminent health care institution
- To provide the highest quality care and service for all people in the prevention, diagnosis and treatment of human illness
- To operate cooperatively and interdependently with the faculty of The Johns Hopkins University to support education in the health professions and research development into the causes and treatment of human illness
- To be the leading health care institution in the application of discovery
- To attract and support physicians and other health care professionals of the highest character and greatest skill
- To provide facilities and amenities that promote the highest quality care, afford solace and enhance the surrounding community

## **Johns Hopkins Medicine Vision**

Johns Hopkins Medicine pushes the boundaries of discovery, transforms health care, advances medical education and creates hope for humanity. Together, we will deliver the promise of medicine.

### **Values**

Excellence & Discovery

*Be the best.* Commit to exceptional quality and service by encouraging curiosity, seeking information and creating innovative solutions.

Leadership & Integrity

*Be a role model.* Inspire others to achieve their best and have the courage to do the right thing.

Diversity and Inclusion

*Be Open.* Embrace and value different backgrounds, opinions and experiences.

Respect & Collegiality

*Be kind.* Listen to understand and embrace others' unique skills and knowledge.

## **Mission Statement of the Schools of Medical Imaging**

The mission of The Johns Hopkins Hospital Schools of Medical Imaging is to provide a comprehensive medical imaging program that will graduate competent entry-level imaging technologists for the healthcare community. The graduates will exemplify qualities of excellence in patient care and safety, professionalism and ethical behavior thereby enhancing the healthcare experience of the patients they serve.

## **Overview of the Programs**

The Johns Hopkins Hospital Schools of Medical Imaging is sponsored by the Russell H. Morgan Department of Radiology and Radiologic Sciences. The Schools have three separate programs: Diagnostic Medical Sonography, Nuclear Medicine Technology and Radiography. All three of the imaging programs at The Johns Hopkins Hospital are 18 months in length. The programs begin in June of each year and end in December of the following year. Students will graduate with a certificate that allows them to sit for the national board examination given by the American Registry of Radiologic Technologists, The Nuclear Medicine Technology Certification Board, and The American Registry of Diagnostic Medical Sonography. Each program has a full-time director and for DMS and Radiography, clinical coordinators. Clinical instructors are employed by the clinical affiliates. The professional and technical staff of the Department of Radiology of The Johns Hopkins Hospital and clinical affiliates also provide didactic and clinical instruction.

The didactic portion of the imaging programs is offered at 111 Market Place, Suite 830, Baltimore, MD 21202. This location has three classrooms, a lounge area and kitchen space for students. There are eight faculty offices. Classrooms are fully equipped with anatomical models, laptops and WiFi, and a print library. Students will have full digital access to the Welch Medical Library, one of the largest medical libraries in the world. The classroom location is easily accessible by car, bus or subway. Most of the academic classes will be held at this location, with some lectures offered at The Johns Hopkins Hospital.

The clinical training in the program will be completed at The Johns Hopkins Hospital, Johns Hopkins Outpatient Center and Johns Hopkins Imaging, as well as numerous other clinical facilities in the Baltimore metropolitan area. The list of the clinical sites is included in the individual program portions of this catalog.

Completion of one of these programs and passing the credentialing examination allows the graduate to obtain employment in a wide variety of imaging locations to include hospitals and outpatient centers.

## **Program Goals and Program Effectiveness Outcomes**

### **Diagnostic Medical Sonography Program Goals**

#### **Goal 1**

To enhance the quality of didactic instruction that will enable the student to comprehend and apply the principles of Diagnostic Medical Sonography. This will be accomplished by:

Objective 1.1 Providing the student with appropriate instruction in all areas of Diagnostic Medical Sonography curriculum as outlined in the DMS curriculum guide.

Objective 1.2 Providing the student with didactic instruction from teaching faculty who are knowledgeable and competent.

Objective 1.3 Offering the students academic support with up-to-date resources in terms of reference books, AV materials and professional publications.

Objective 1.4 Recruiting those students who are well prepared to meet the academic challenges of a program in Diagnostic Medical Sonography.

#### **Goal 2**

Enhance the quality of clinical instruction that will enable the student the opportunity to develop adequate clinical skills necessary to function as an effective entry-level diagnostic medical sonographer upon graduation. This will be accomplished by:

Objective 2.1 Providing the student with the knowledge to consistently apply principles of Diagnostic Medical Sonography and produce images of diagnostic quality.

Objective 2.2 Providing the student with clinical instruction in a variety of clinical settings to ensure entry-level competency in all areas of diagnostic medical sonography.

Objective 2.3 Providing the student with introductory classes in the principles and practices of correlative imaging modalities.

Objective 2.4 Developing critical thinking skills in order to produce diagnostic sonographic images.

#### **Goal 3**

To graduate students who exhibit the qualities of professionalism that will enable them to function as an integral member of the health care team. This will be accomplished by:

Objective 3.1 Developing effective communication skills that will enable the student to interact effectively and communicate appropriately with staff and administration as an integral member of the health care team.

Objective 3.2 Encouraging and motivating the student to continue professional growth and education.

#### Goal 4

To graduate students who possess the knowledge and clinical skills to provide optimal patient care. This will be accomplished by:

Objective 4.1 Developing effective communication skills that will enable the student to interact effectively and communicate appropriately with patients and patients' families.

Objective 4.2 Providing the student with training that will enable the student to give a safe and appropriate level of patient care.

### **Diagnostic Medical Sonography Program Effectiveness Data 2018-2019**

#### 2018 Graduates Outcomes

American Registry of Diagnostic Medical Sonography:

Sonographic Principles and Instrumentation 100%

Abdomen 100%

Obstetrics and Gynecology 100%

Attrition 0%

Job Placement 100%

#### 2019 Graduates

American Registry of Diagnostic Medical Sonography:

Sonographic Principles and Instrumentation 100%

Abdomen 100%

Obstetrics and Gynecology 86%

Attrition 0%

Job Placement 100%

### **Nuclear Medicine Technology Program Student Learning Outcomes**

Student Learning Outcome 1:

The student will become proficient in venipuncture.

Student Learning Outcome 2:

The student will produce high quality nuclear medicine images.

Student Learning Outcome 3:

The student will exhibit qualities of compassion and patient care.

Student Learning Outcome 4:

Graduates will pass the Nuclear Medicine Technology and/or the ARRT registry examination.



Student Learning Outcome 5:

The student will apply knowledge of radiation safety and governing regulations.

Student Learning Outcome 6:

Students will demonstrate oral communication skills.

Student Learning Outcome 7:

Students will demonstrate written communication skills.

## **Nuclear Medicine Technology Program Effectiveness Data 2018 and 2019**

Class of 2018

Program completion: 4/5: 80%

100% passed one or both of the NMTCB or ARRT on the first attempt.

100 % job placement rate within 6 months of graduation.

Class of 2019

Program completion: 5/6: 83.3%

83.3% passed one or both of the NMTCB or ARRT on the first attempt.

100% passed on the second attempt.

100% job placement rate within 6 months of graduation.

## **Radiography Program Goals and Student Learning Outcomes**

Goal 1:

Students will demonstrate critical thinking skills in the classroom and clinical setting.

Student Learning Outcomes:

- Students will be able to formulate effective technical factors based on patient body habitus, trauma, pathology and physical and equipment limitations.
- Students will critically evaluate completed radiographs

Goal 2:

Students will demonstrate skill in written and oral expression

Student learning outcomes:

- Students will demonstrate written communication skills
- Students will demonstrate oral communication skills

Goal 3:

Students will demonstrate professionalism.

Student learning outcomes:

- Students will model professional behavior in the clinical setting
- Students will demonstrate professional behavior in the classroom setting by working effectively on a team

Goal 4:

Students will demonstrate competency in entry-level radiography skills

Student learning outcomes:

- The student will produce radiographs of diagnostic quality
- The student will exhibit quality patient care.

### **Radiography Program Effectiveness Data 2015- 2019**

ARRT pass rate: 2015 - 2019

The Radiography program's 5 year average pass rate on the credentialing examination is 98.4% on the first attempt.

2015: 100% 7/7 students passed on the first attempt

2016: 90.9% 10/11 passed on first attempt\*

2017: 100% 18/18 students passed on the first attempt

2018: 100% 12/12 students passed on the first attempt

2019: 100% 15/15 passed on first attempt

\*100% of students passed on the second attempt.

Program Completion Rate 2019: 100% 15 students matriculated, 15 graduated.

Job Placement Rate within 12 months of graduation. 2012 – 2016: 5 year average is 100%

2015: 100.0% 7/7 students

2016: 100% 11/11 students

2017: 100% 18/18 students

2018: 100% 12/12 students

2019: 100% 15/15 students

This information may also be viewed on the JRCERT website at

[www.jrcert.org](http://www.jrcert.org)

### **Accreditation and Approval**

The Diagnostic Medical Sonography program is accredited by:

The Commission on Accreditation of Allied Health Education Programs (CAAHEP)

1361 Park Street

Clearwater, FL 33756

Phone: (727) 210-2350

Fax: (727) 210-2354

<http://www.caahep.org/>

Upon the recommendation of:

The Joint Review Committee on Education in Diagnostic Medical Sonography (JRC-DMS)

6021 University Boulevard, Suite 500

Ellicott City, MD 21043

(443) 973-3251

<http://www.jrcdms.org/>

The Nuclear Medicine Technology Program is accredited by:

The Joint Review Committee on Education in Nuclear Medicine Technology.

820 W. Danforth Road #B1

Edmund, OK 73003

405-285-0546

[mail@jrcnmt.org](mailto:mail@jrcnmt.org)

The Radiography Program is accredited by:

The Joint Review Committee on Education in Radiologic Technology

20 N. Wacker Drive, Suite 2850

Chicago, IL 60606-3182

312-704-5304

[mail@jrcert.org](mailto:mail@jrcert.org)

The Johns Hopkins Hospital Schools of Medical Imaging is approved by:

Maryland Higher Education Commission

6 North Liberty Street

Baltimore, MD 21201

410-767-3301

Students may contact Maryland Higher Education to access such information as the program enrollment, completion rate, placement rate and pass rate on the credentialing examination.

### **Administration and Faculty**

Karen Horton, MD

Radiology Department Chairperson

Stacey Baldwin, MBA

Radiology Administrator, President, Johns Hopkins Imaging

Peg Cooper, MBA

Radiology Administrator for Clinical Operations

Sandra Moore, MA, RT(R)(M)

Director, Schools of Medical Imaging,

[semoore@jhmi.edu](mailto:semoore@jhmi.edu)

### **Diagnostic Medical Sonography Program Faculty**

Sheila Sheth, MD, Medical Director

Carol B. Iversen, MS, RDMS Sonography Program Director

[cblank1@jhmi.edu](mailto:cblank1@jhmi.edu)

Edward Yuhanna, BA, RDMS, RVT, RMSKS Sonography Clinical Coordinator

[eyuhann1@jhmi.edu](mailto:eyuhann1@jhmi.edu)

#### **Student Instructor Ratio:**

Lecture: 12:1

Laboratory: 2:1

Clinical 1:1

### **Nuclear Medicine Technology Program**

Sandra E. Moore, MA, RT(R)(M), Interim Program Director

A. Cahid Civelek, MD, Medical Advisor

#### **Student Instructor Ratio**

Lecture: 8:1

Lab 2:1

Clinical 1:1

### **Radiography Program Faculty**

John Eng, MD, Medical Director

Stacey A. Bickling, MEHP, RT(R) Radiography Program Director

[sbickli1@jhmi.edu](mailto:sbickli1@jhmi.edu)

Allison E. Mason, BS, RT(R), Radiography Clinical Coordinator

[amason16@jhmi.edu](mailto:amason16@jhmi.edu)

#### **Student Instructor Ratio**

Lecture: 22:1

Laboratory 3:1

Clinical 1:1

## Calendar 2020-2021

<b>Date</b>	<b>Event</b>
Monday, June 1, 2020	All programs begin
Monday, June 1, 2020	Start date Semester 1
Friday, July 3, 2020	4 <sup>th</sup> of July holiday Day Off
Monday, September 7, 2020	Labor Day holiday
Monday-Friday, November 23-27, 2020	Thanksgiving holiday
Friday, December 25, 2020	Christmas holiday
Thursday, December 31, 2020	End Date Semester 1
Friday, January 1, 2021	New Year's Day holiday
Monday, January 4, 2021	Start date Semester 2
Monday, January 18, 2021	Martin Luther King holiday
Monday-Friday, April 5-April 9, 2021	Spring Break
Monday, May 31, 2021	Memorial Day holiday
Friday, June 4, 2021	End date Semester 2
Monday, June 7, 2021	Start date Semester 3
Monday, July 5, 2021	4 <sup>th</sup> of July holiday
Monday, September 6, 2021	Labor Day holiday
Thursday-Friday, November 25-26, 2021	Thanksgiving holiday
Friday, December 10, 2021	Graduation, all programs

Total program hours from June 1, 2020 through December 10, 2021 equals 3,064 hours. This is based on an 8-hour day, 40 hours per week for 80 weeks. Students will not be in attendance on holidays, personal days off and spring break.

## Calendar 2021-2022

<b>Date</b>	<b>Event</b>
Tuesday, June 1, 2021	All programs begin
Tuesday, June 1, 2021	Start date Semester 1
Monday, July 5, 2021	4 <sup>th</sup> of July holiday Day Off
Monday, September 6, 2021	Labor Day holiday
Monday-Friday, November 22-26, 2021	Thanksgiving holiday
Friday, December 24, 2021	Christmas holiday
Thursday, December 30, 2021	End date Semester 1
Friday, December 31, 2021	New Year's Day holiday
Monday, January 3, 2022	Start date Semester 2
Monday, January 18, 2022	Martin Luther King holiday
April 18-April 22, 2022	Spring Break
Monday, May 30, 2022	Memorial Day holiday
Friday, June 3, 2020	End date Semester 2
Monday, June 6, 2022	Start date Semester 3

Monday, July 4, 2022	4 <sup>th</sup> of July holiday
Monday, September 5, 2022	Labor Day holiday
Thursday-Friday, November 25-26, 2022	Thanksgiving holiday
Friday, December 9, 2022	Graduation, all programs

Total program hours from June 1, 2021 through December 9, 2022 equals 3,064 hours. This is based on an 8-hour day, 40 hours per week for 80 weeks. Students will not be in attendance on holidays, personal days off and spring break.

### **Required Program Academic and Clinical Hours**

All programs are 18 months long. Lecture and clinical hours will vary for each program, but all programs will total 3064 hours in total time. Scheduled times will vary in each program and are listed in the individual program section of this catalog.

### **Applications and Admission**

Diagnostic Medical Sonography Program applicants must have a minimum of an Associate's degree or be enrolled in one of the universities that affiliate with the Schools of Medical Imaging by the date of matriculation or be a graduate of a clinically related accredited program in Allied Health with appropriate credentials.

Nuclear Medicine Technology applicants must have a minimum of an Associate's degree or be enrolled in one of the universities that affiliate with the Schools of Medical Imaging by the date of matriculation.

Radiography applicants must have a minimum of an Associate's degree at the time of matriculation or be enrolled in one of the colleges that affiliate with The Schools of Medical Imaging. Students must complete the degree at the time of graduation to be eligible to sit for the credentialing examination.

Students enrolled in one of the affiliate universities must complete the bachelor's degree at the time of graduation from the Schools of Medical Imaging.

### **General Application Information**

All three imaging programs begin in early June of each year. There is one cohort admitted each year. All applications and application fees must be **postmarked** by December 31<sup>st</sup> for the program that begins the following June. All supporting documents and transcripts must be **received** no later than January 15<sup>th</sup> of the matriculation year. Applications postmarked after December 31<sup>st</sup> or failure to supply supporting documents by January 15<sup>th</sup>,

will only be considered on a space-available basis. It is the responsibility of the applicant to ensure that all materials are received.

Complete applications include:

- Application fee of \$40.00 (non-refundable)
- Completed application form (see application section on the website)
- Two references forms: one from a current employer and one from a professor of math or science, completed on program forms (see application section of the website)
- Transcripts documenting **all** post-high school education.
- All prerequisite course work must be completed at a regionally accredited institution.
- Applicants who meet the qualifications specified (see prerequisite courses) will be required to participate in a personal interview. The candidate will be evaluated in an individual interview by a panel. The candidate will be evaluated for professional appearance, behavior and demeanor, ability to answer questions, ability to speak/communicate and overall impression. ***Criminal convictions may affect a student's ability to be credentialed or licensed.*** If a prospective student has ever been charged with or convicted of a felony or misdemeanor, or has been subject to a disciplinary action (such as suspension or dismissal) from another program, the prospective student must contact their respective credentialing agency to apply for a pre-application review of eligibility.

Diagnostic Medical Sonography Program:

<https://www.ardms.org/wp-content/uploads/pdf/Pre-application-Criminal-ARDMS.pdf>

Nuclear Medicine Technology Program:

<https://www.nmtcb.org/faq/index.php?p=default&cat=8>

Radiography Program:

<https://www.arrt.org/earn-arrt-credentials/requirements/ethics-requirements/ethics-review-preapplication>

Acceptance decisions are based on the following:

- GPA in the prerequisite coursework, and in the event of a tie, GPA in all college-level coursework completed. All programs require a minimum of 3.0 GPA in the required prerequisite courses.
- Computer skills assessment
- Interview scores
- Successful completion of the background check
- Successful completion of the hospital drug screening
- Successful completion of any outstanding prerequisite coursework

While acceptance decisions are not based on volunteer experience, the candidate is encouraged to volunteer in a health care setting in order to solidify the student's desire to work in a health-related profession. While prospective students may volunteer at The Johns Hopkins Hospital, the Schools of Medical Imaging does not offer shadow experiences.

In cases where applicants are equally qualified, the program admissions committee will make the final selection.

### **Prerequisite Course Work**

There are individual requirements and program prerequisite courses for each of the three imaging programs. To calculate your prerequisite GPA, go to the "prerequisite course" section on the program website and click on the spreadsheet:

<https://somi.jh.edu/programs/diagnostic-medical-sonography/>

<https://somi.jh.edu/programs/nuclear-medicine-technology/>

<https://somi.jh.edu/programs/radiography/>

All prerequisite courses need to be taken at an college or university accredited by U.S. regional accreditation. The requirements are as follows:

#### **Diagnostic Medical Sonography**

- Human Anatomy & Physiology I and II (4 credits each with laboratory)
- College or General Physics (Algebra-based, 4 credits with laboratory)
- College Algebra or higher mathematics
- Medical Terminology – This course must be taken at the college level for credit.
- The applicant must complete one of the following: Speech and Communications or Public Speaking
- Statistics
- Psychology

#### **Nuclear Medicine Technology**

- Human Anatomy & Physiology I and II (4 credits each with laboratory)
- College Algebra
- College Physics (Algebra-based, 4 credits with laboratory)
- General or Inorganic Chemistry (4 credits with laboratory)
- Medical Terminology – This course must be taken at the college level, for credit.
- The applicant must complete one of the following: Public Speaking or Interpersonal Communication
- English Composition

#### **Radiography**



- Human Anatomy and Physiology I and II, (4 credits each with laboratory)
- College Algebra
- English Composition
- The applicant must complete one of the following: Public speaking or Interpersonal communication

### **Recommendations**

All applicants must submit two recommendation forms (found on the website). One recommendation form must be from a professor of math or science and the other form must be from a current employer. Students who have previously completed another allied health program must have a recommendation form from their program director. Any exceptions to this must be made by the program director.

### **Background Check**

Consistent with The Johns Hopkins Hospital policy of requiring a criminal background check for all employees, this requirement is also extended to all students accepted by the Schools of Medical Imaging. Once accepted, the background check will be initiated by the student and will be conducted by PreCheck, Inc., at a current cost of \$48.50 per student. The fee for the background check is paid by the student. An acceptable background screening will be required for all students beginning the Program.

### **Physical and Technical Requirements**

The student will be expected to do the following:

- Push, pull and lift a minimum of 40-50 pounds.
- Assist patients on and off imaging tables, wheelchairs and stretchers.
- Stand for long periods of time.
- Push and maneuver wheelchairs, stretchers and IV poles.
- Be capable of fine motor control to handle equipment settings, computer use and injection syringes. For Sonography, be able to manipulate the transducer to obtain images.
- Auditory capabilities to hear patient requests, monitoring devices and instructions from staff or physicians made in a normal speaking voice.
  - For Sonography, be able to hear and interpret Doppler signals
- Visual acuity to distinguish shades of grey, read patient monitoring devices and see small details on the medical image.
  - For Sonography, able to see all colors.
- Perform CPR.
- Performing twisting, lifting, pulling and carrying for purposes of moving equipment, transporting cassettes and moving patients.
- Communication abilities to accurately receive, comprehend, write and interpret verbal and written communication in both academic and clinical settings.

- For Radiography, be able to wear lead protective clothing for periods of 2-3 hours at a time.

Prospective students who have questions about performing any of the above activities should contact the Program Director. There may be other technical requirements for individual imaging programs.

### **Degree Options For All Programs**

**Notre Dame of Maryland University**, located in Baltimore, MD, offers a program leading to a Bachelor's degree in Radiologic Sciences. Students will complete their prerequisite and general education coursework at NDMU, and then fulfill their degree requirements by completing the imaging specialty program at The Johns Hopkins Hospital. Please contact the advising office of Notre Dame of Maryland University at 410-532-5500, or see the webpage at <http://www.ndm.edu> and look for the link to Adult Undergraduate Studies for further information.

**Bloomsburg University** located in Bloomsburg, Pennsylvania, offers a program leading to a Bachelor's degree in Medical Imaging. Students will complete their prerequisite and general education coursework at Bloomsburg, and then fulfill their degree requirements by completing the imaging program. Please contact the advising office at Bloomsburg University at 570-389-4130, or access the webpage at <http://www.bloomu.edu> for further information.

**Immaculata University**, located in Immaculata, Pennsylvania, offers a program leading to a Bachelor of Science in Allied Health. The students will complete general education and prerequisite course work at Immaculata University. Once these courses are completed, the student may apply to one of the imaging programs. If the student is accepted and completes the imaging program, Immaculata will grant a Bachelor of Science degree. Please contact the advising office of Immaculata University at 610-647-4400 or see the webpage at <http://www.immaculata.edu> for further information.

### **Radiography Program Only Degree Options**

**Anne Arundel Community College**, located in Arnold, Maryland offers the opportunity for prospective students to complete an Associate's degree in Radiologic Technology. The student must complete all program prerequisites and general education coursework before being accepted into the Radiography Program.

For further information, please contact Anne Arundel Community College at 410-777-2222 or access the webpage at [www.aacc.edu](http://www.aacc.edu)

**Carroll Community College**, located in Westminster, Maryland offers the opportunity for the student to complete an Associate's degree in General

Studies. The student must complete all program prerequisites and general education coursework before being accepted into the Radiography Program. For further information please contact the advising office at Carroll Community College at 410-386-8000 or access the webpage at [www.carrollcc.edu](http://www.carrollcc.edu)

**Harford Community College**, located in Bel Air, Maryland offers the opportunity for the prospective student to complete an Associate's degree in Technical and Professional Studies. The student must complete all program prerequisites and general education coursework before being accepted into the Radiography Program.

For further information, please contact the advising office at Harford Community College at 443-412-2000, or access the webpage at <http://www.harford.edu>

### **Physical Health Examination**

Before the date of matriculation, all students will receive a routine physical examination. Drug testing is performed as part of this physical. CBD product usage may result in a positive drug test and will preclude a student from starting the program. The Johns Hopkins Hospital and all clinical affiliates are drug-free environments and students will not be permitted to enroll if they fail the drug screening.

The routine physical examination, conducted by The Johns Hopkins Hospital Occupational Health, will require the student to show proof of immunity to childhood illness, such as measles, mumps, rubella and varicella. Students who fail to show immunity to these childhood diseases will be offered the vaccines. Students will receive one tuberculosis skin test at the time of the physical and will repeat the test in six weeks. Students will have the opportunity to receive the series of Hepatitis B vaccinations. All students will be required to have a yearly influenza vaccination, which is provided by the hospital. There is no fee for the above-named services.

### **Transfer Credit Policy**

Transfer credit is not given for previous academic or clinical training in the imaging sciences.

### **Tuition and Fees**

Application fee:	\$40.00 (non-refundable)
Background Check:	\$48.50 (only for accepted students)
Tuition:	\$17,500.00 Diagnostic Medical Sonography
Tuition:	\$11,000.00 Nuclear Medicine Technology
Tuition:	\$8,500.00 Radiography Program
CPR Certification:	\$30.00: non-refundable
Technology fee:	\$150.00: non-refundable upon matriculation

Uniforms:	Approximately \$300.00: arrangements for refunds are made through the vendor
Books:	\$650.00 DMS
Books:	\$600.00 NMT
Books:	\$700.00 Radiography
Total amount for each program:	
Diagnostic Medical Sonography:	\$18,418.50
Nuclear Medicine Technology:	\$11,868.50
Radiography:	\$ 9,768.50

All students will need a personal laptop and internet access in order to complete homework assignments and online teaching. The cost of this will vary with student choice of computer and internet plan.

Tuition is paid in 4 equal installments during the first 13 months of the program. Please note that all tuition and fees are subject to change. These figures do not include room, board, health insurance or transportation. Uniforms are purchased through the program vendor. Radiography program books will be purchased through the program vendor. All textbooks (most current edition) and uniforms specified by the program are required.

### **Tuition Payment**

The office does not send out invoices for tuition. The payment schedule for tuition is as follows

June 1

October 15

March 1

July 15

The payment amounts due on the dates are

Diagnostic Medical Sonography: \$4,375.00

Nuclear Medicine Technology: \$2,750.00

Radiography: \$2,125.00

- Payment may be deferred if the students is receiving financial aid from Bloomsburg, Notre Dame, Immaculata or VA benefits.
- Students who do not pay their tuition on time may be offered a 2-week grace period. At the end of the 2-week grace period, the payment must be made, along with a \$35.00 late fee. One day late for payment requires a late fee. The program director may offer a waiver for the due date if it falls on a weekend, holiday or if the student is ill or otherwise absent from the program. Payment must then be made on the first available program day.
- Students who have failed to make the tuition payment within 21 calendar days of the due date, will be suspended from the program.

The program director has the right to determine if quizzes, tests or finals may be made up. All missed time will be made up after graduation unless the students uses their bank of leave time.

- Failure to make the tuition payment within 30 calendar days will result in dismissal from the program.

Students who are awaiting financial aid from their home university will be allowed to wait for their financial aid to arrive before payment of tuition. For those students applying for VA benefits, the Schools of Medical Imaging will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries or other institutional facilities, or the requirement that an individual borrow additional funds, on any covered individual because of the individual's inability to meet his or her financial obligations to the institution due to the delayed disbursement funding from VA under Chapter 31 or 33.

### **Financial Aid**

The Schools of Medical Imaging is recognized as an eligible institution of higher education for purposes of state financial aid programs. These include Maryland State Scholarships and Veterans Benefits, but do not include Federal financial aid such as Pell Grants and Stafford loans. All financial arrangements should be resolved before attending the program. Students receiving scholarships may defer that part of their tuition that will be covered by the scholarships. The remaining amount must be paid by the due date. Students may also apply for loans through Sallie Mae. The student may pay for tuition payments by using a check or major credit card. Students may also wish to apply for a personal loan through their banking institution.

Because the Schools of Medical Imaging does not participate with federal financial aid, the Schools may not sign off on any government loan deferment.

Upon request, The Schools of Medical Imaging will issue an end-of-year statement that indicates payment of tuition. The ability to use the statement to defer federal taxes is made upon the advice of a tax advisor and does not involve input from the Schools of Medical Imaging.

### **VA Approved Program**

The Schools of Medical Imaging programs are approved by the Maryland State Approving Agency to offer training to veterans and other eligible dependents under the VA educational benefit programs.

The individual program will obtain written records on a VA beneficiary's previous education and experience and complete an evaluation. The program generally does not grant credit for previous radiography training, and requests for such must be addressed to the program director.

The program will notify the VA of any change in the enrollment status of students certified to receive Veterans educational benefits. This would include when the student is placed on attendance or academic probation, changes in scheduling or termination of training.

The program will maintain grade records which are updated on a semester basis. VA students who are due a refund, will have the monies reimbursed within 40 days of the last day of attendance.

### **Refund Policy**

All fees paid by a student shall be refunded if the student chooses not to enroll in or to withdraw from the school within 7 calendar days after having signed a contract. If, after the 7-day cancellation period expires, a student withdraws after instruction begins, refunds shall be based on the total contract price (assuming that the entire tuition was paid prior to the start of the program) for the course or program and shall include all fees, except registration and application and enrollment fees, any charges for materials, supplies, or books that have purchased from the hospital by the student, and are the property of, the student. If the students is on an official leave of absence, and fails to return to training by the end of the leave of absence, a refund due to a student shall be based on the date of withdrawal or termination and paid within 60 days of the scheduled last day of the leave of absence.

Uniforms, books, technology fee, application fees and CPR fees are not refundable.

Percentages of refunds are based on the academic/billing period completed by date of withdrawal.

Less than 10%	90% refund
10% up to but not including 20%	80% refund
20% up to but not including 30%	60% refund
30% up to but not including 40%	40% refund
40% up to 50%	20% refund
More than 50%	no refund

A refund due a student shall be based on the date of withdrawal or termination and paid within 60 days from the date of withdrawal or termination. In case of an official leave of absence, if a student fails to return to training by the end of the leave of absence, any refund will be based on the date of withdrawal or termination and paid within 60 days of the scheduled last day of the leave of absence. If the school closes or discontinues a course or program, the school will refund to each currently enrolled student monies paid by the student for tuition and fees.

The amount charged a recipient of VA educational funds for tuition, fees and other charges for a portion of the course will not exceed the approximate prorated portion of the total charges for tuition, fees, and other charges that the length of the completed portion of the program bears to the total length. The Program may retain \$10.00 for administrative costs.

## **Student Records and Transcripts**

The imaging programs maintain all grade records for students. The form to request a transcript may be found on the website. There is no cost for transcripts. Please send the transcript request form to The Johns Hopkins Hospital, Schools of Medical Imaging, 111 Market Place, Suite 830, Baltimore, MD, 21202 or email it to the respective program director.

## **Student Placement Assistance**

Students are not guaranteed employment upon graduation. The program director will pass along information concerning job openings and opportunities.

## **Right to Make Changes to the Program**

The Schools of Medical Imaging will continually review and update program policies in accordance with their accrediting body standards, Maryland Higher Education Commission and upon the advice and approval of the program's advisory board. The program reserves the right to change administration policies and other regulations at any time with appropriate notice to the student.

## **Health Insurance**

Health insurance is required of all students while enrolled in the program. Proof of enrollment will be required. Any student not covered by a personal health insurance policy will not be permitted to participate in clinical training. Any time missed due to lack of coverage will be removed from the student's bank of leave time. Students may obtain their own health insurance or purchase it through the Schools of Medical Imaging. Cost for this plan may be obtained through the individual program directors. Consideration of whether you can receive healthcare in the state of Maryland would be advised.

## **Grading Policies**

Didactic (Classroom) Grading Standards:

- Passing grade, "C", for all courses is 75%.
- Students will be issued a written notice of academic warning if, at any point past mid-course, the student's average is between 75-78%.
- Students will be issued a written notice of academic probation if, at any point past mid-course, the student's average is below 75%.
- Failure of any course will result in academic dismissal.

% score	4.0 scale/	Letter Grade
92 - 100	3.35 - 4.00	A
84 - 91	2.70 - 3.30	B
75 - 83	2.00 - 2.65	C (minimum passing grade)
Below 75.0	< 1.00	F

### Clinical Grading Standards:

- Passing grade for all clinical testing and evaluations is 84% for Diagnostic Medical Sonography and Nuclear Medicine Technology and 2.5 on a 4-point scale for Radiography. Failure of a clinical course will result in clinical dismissal.

Academic probation and warnings will not impact the student's grade and will remain in effect until the end of the course. A student who is placed on probation for attendance issues, or a student who is placed on clinical probation for serious issues such as patient care, radiation safety or ethical issues will be placed on probation for the remainder of the program. Students who fail to achieve the minimum passing grade for any academic class or clinical semester, or who fail to comply with the conditions of a clinical probation will be dismissed from the program. Student grades will be recorded each semester and given to the student.

Students who have been dismissed from the Schools of Medical Imaging for unsatisfactory academic grades may reapply to the program. Credit may not be given for advanced standing should the student be readmitted and will be at the discretion of the program director. Students who are dismissed clinically may not apply for readmission.

### **Academic Integrity Policy**

Students in The Johns Hopkins Hospital, Schools of Medical Imaging are expected to exhibit the highest standards of academic integrity at all times. This includes but may not be limited to:

- Cheating: the deliberate use of unauthorized materials or information in the performance of any academic exercise. This would also include falsification of any records, documents or information.
- Assisting another student in academic dishonesty: deliberately assisting another student in the use of unauthorized materials or information.
- Plagiarism: intentionally adopting the words or ideas of another person without giving that person due credit for such words or ideas.

Adherence to the Academic Integrity Policy is expected and required. Violations of this policy are viewed as a serious offense because it diminishes the quality of scholarship and misrepresents professional knowledge and integrity. Penalties for violations of the above policy will result in dismissal from the Program.

### **Graduation Requirements**

To graduate, students must demonstrate satisfactory progress in classwork (minimum grade average of 75%), clinical requirements (84% for DMS and NMT, and 2.5 on a 4.0 scale for Radiography) and complete all hours of instruction for the program (3,064 hours). A student cannot miss more than 96 hours of the program. Once the 96 hours of leave have been used, the



student may be granted an additional 40 hours of emergency leave that must be made up before graduation. A student who misses more than 96 hours of leave, and 40 hours of emergency leave will be dismissed. Outstanding financial issues with the hospital or the Schools of Medical Imaging must be resolved before graduation.

### **Program Schedule**

These programs are full-time, Monday through Friday, 40 hours per week. Students will not be in attendance for hospital holidays, spring break or weekends and will have a total of 96 hours of leave during the program. Students will have one week off at Thanksgiving (juniors only) and spring break. Hours will vary by the program and are posted in the individual sections of this catalog.

### **Resources and Services**

The enrolled student will have multiple resources and services available to them. These include:

- A wide variety of imaging suites
- A wide variety of imaging equipment

#### Computers

- The Schools of Medical Imaging has laptop computers and printers for student use during class time.
- Students will need to have a personal laptop and internet access for homework and access to online teaching.

#### Wi-Fi

- Wi-Fi is available at the Market Place and JHH and JH Imaging locations. Wi-Fi at other imaging sites is at the discretion of the site.

#### Welch Medical Library

- The Welch Medical Library is one of the foremost medical libraries in the world. All students have the same access as any employee to all library services.

#### Candler Building Gym

- The Candler Building (classroom and office location) has an on-site gym that is free of charge for students.

#### The Denton Cooley Center

- Students may elect to purchase full membership in this athletic facility. The Center is located directly behind Reed Hall adjacent to the Outpatient Center and contains an indoor track, racquetball, basketball, and volleyball courts, saunas, showers and locker rooms.

### Physical and Vaccinations

- The Johns Hopkins Hospital provides a pre-matriculation physical to include a drug screening. Hepatitis B and vaccinations for childhood diseases are available through Occupational Health. Yearly influenza vaccinations are free and are mandatory.

### Microsoft Office

- Students will have access to Microsoft 360 free of charge.
- Students will have a Microsoft Outlook email account for use while in the program.

### CPR certification

- The student will be American Heart Healthcare Provider CPR certified at a cost of \$30.00. CPR training must be done at The Johns Hopkins Hospital. This training will be scheduled once the student has been accepted and matriculated. Payment is made directly to the CPR office.

### Health Insurance

- The student may purchase health insurance through the hospital. Please inquire through the individual program directors for more information and fees.

### Mass Transit

- The student may purchase a mass-transit pass at any Baltimore metro station. Both the East Baltimore campus of The Johns Hopkins Hospital and the classroom location are easily accessible by metro or bus. Affiliate clinical sites will require the student's personal transportation.

### Personal Counseling

- Students who desire personal counseling should contact their private physician for recommendation for counseling services.

### Accommodations for Disabilities

- If a student has a documented learning, psychological or physical disability, the student may be entitled to reasonable academic accommodations or services. To request accommodations or services, contact the Program Director. All students are expected to fulfill essential course requirements. The Program cannot waive any essential skill or requirement of a course.

### Parking

- Students may access both The Johns Hopkins Hospital and Market Place classroom location by public transportation. If the student

chooses to drive to and park at either the hospital or classroom location, there will be a fee for parking (about \$9.00-\$24.00 per day). All Johns Hopkins Imaging sites and all affiliate clinical sites offer free parking.

### **Uniform Requirements**

Students in The Johns Hopkins Hospital Schools of Medical Imaging Programs represents the Hospital, the profession and of all healthcare providers. A student's appearance is a reflection of their professionalism. Therefore, trendy modes of dress, hairstyle and general appearance that may be acceptable in a social setting are not appropriate for healthcare providers. Program faculty reserves the right to require that students' personal appearance conform to professional standards. Individual uniform requirements for each imaging program will be provided upon acceptance. Uniforms are purchased from the program vendor.

### **Absentee and Leave Policy**

The student will be off on the following days:

- New Year's Day
- Martin Luther King Day
- Spring Break (one week)
- Memorial Day
- July 4<sup>th</sup>
- Labor Day
- Thanksgiving and the day after (senior students)
- Thanksgiving week (junior students)
- Christmas Day

Please see the academic calendar in this catalog for exact dates.

In addition to the above-named days, the student will be awarded a bank of 12 days (96 hours) to use for personal and sick time. The student may use this time at their discretion with the following stipulations:

- Absences due to personal illness of 3 days or longer will require a physician's note.
- Scheduled absences on class days are at the discretion of the instructor. A physician's note, in case of illness, may be required for an unscheduled absence. It is the student's responsibility to contact the instructor directly and arrange for the possibility of make-up work. Exams, tests or quizzes are made up at the discretion of the instructor. Should the student fail to contact the instructor in the event of a known absence, any missed quizzes or tests will be made up at the discretion of the program faculty.
- Time missed from the classroom or clinic due to tardiness will be removed from the student's bank of time. This time will be removed in increments of 15 minutes.

- The faculty reserves the right at any time to ask for proof of an unscheduled absence. This will include a health care provider's note, court document, towing or garage receipt, etc.
- Students who must miss class or clinic due to an unexpected illness or emergency must contact the program faculty and designated clinical staff at the student's assigned clinical site. If a student fails to contact the program faculty and designated clinical staff prior to the assigned start time, the student will be issued a clinical warning (first offense only). Should the student fail to contact the appropriate program faculty and the clinical instructor on a second occasion, the second offense will result in the student being placed on probation and will remain in effect throughout the remainder of the program. A third offense will result in dismissal. Students who leave a clinical site early without permission from the program director or the clinical coordinator will fall under the same policy. If this is a classroom day, the classroom instructor must be notified.
- If a student is absent due to jury duty, no leave is charged, but proof of attendance will be required. If a student must attend any other court hearing that involves issues personal to the student, time will be removed from the student's bank of leave.
- Student attendance is calculated on an ongoing basis. There is no minimum or maximum time that may be used in each semester, but the student may not go over the total amount of time allotted. The program does not have an attendance probationary period. The student may confer with the program faculty at any point to determine the amount of time in their bank of leave hours.
- A student may not use extended leave time (more than 16 hours) until after July 1, except in the case of serious personal or family illness.
- Once a student has exhausted his/her bank of leave hours, absences will be limited to illness, emergency or scheduled appointments, and all time must be made up. All emergency leave must include documentation of absence, such as a health care provider's letter. Emergency leave is defined as an acute illness, physician appointment or court date. Students may use up to and including 40 hours of emergency leave.
- Emergency leave must be made up before the student receives a certificate of graduation or be allowed to sit for the respective program boards. Make-up time must be approved by the program director and clinical coordinator and a make-up time request form completed.
- If the student uses more than 40 hours of emergency leave, they will be dismissed from the program

## **Lateness or Absence**

Students are expected to be present and on time for classroom lectures and program events. This means the student is present and prepared to begin before the scheduled start time. There are grade penalties for lateness or absence from class.

The following policies will apply to all classes and clinical lab.

- One point will be removed from the student's final course grade for each absence or late arrival to class either at the beginning of class or returning from the break.
- In the event of lateness or absence from class, it is the prerogative of the instructor to allow the student to make up the quiz. Missed quizzes that are not made up will be entered as a zero for grading purposes. Missed tests will be given at a date and time determined by the instructor. In most cases, this will be the first day the student returns to class. It is the student's responsibility to contact the course instructor regarding make-up quizzes. Absences on test days will require documentation of excused absence, i.e., physician's note, towing receipt, court document, etc.

Lateness to a clinical assignment is an occurrence, which is explained in Attendance Management. Unauthorized absence from an assigned clinical area for 30 minutes or more, or failure to call in an absence according to the policy or lateness according to program policies and procedures may result in a written warning.

It is illegal in the state of Maryland to text while driving or use a cell phone unless it is hands-free. Do not talk or text and drive. Call the appropriate faculty member immediately upon arrival.

### **Attendance Management**

- Students are expected to exhibit the qualities of dependability and timeliness while on assignment in clinical rotations.
- An *unscheduled absence* is a failure to report for a scheduled shift or consecutive shifts, whatever the reason, including a medically verified illness. Each unscheduled absence counts as one occurrence. If an unscheduled absence due to illness occurs, and the student is out on consecutive clinical days, this counts as one occurrence. For example, if a student calls out sick on November 1<sup>st</sup> and remains out on November 2<sup>nd</sup> and November 3<sup>rd</sup>, this counts as one occurrence. If a student is out on November 1<sup>st</sup>, November 15<sup>th</sup> and November 20<sup>th</sup>, this is three occurrences. Absences covered under the leave of absence policy are not chargeable for disciplinary action purposes. Please note absences that are pre-approved by the program are not counted as an unscheduled absence.

- A *shortened work shift* means missing any part of a work shift due to lateness either at the beginning of the day or when returning from lunch or leaving early. Each incident will count as 1/2 of one occurrence.
- The program faculty will determine if the absence is one-half or one occurrence.

<b>Unscheduled Absences and/or Shortened Work Shifts For 18 Month Program</b>	<b>Disciplinary Action</b>
3 occurrences	Verbal Warning
6 occurrences	Written warning with grade implication
9 occurrences	Probation with grade implication
12 occurrences	Dismissal

### **Leave of Absence**

A Leave of Absence (LOA) may be granted due to illness or serious established need. The maximum LOA within the 18-month Program may not exceed 60 calendar days. The student must submit a written request for consideration of approval of a leave of absence to the Director. Final approval of the request rests with the Director. A student returning from LOA due to illness must have physician clearance before re-entering the program and will be expected to resume normal duties and clinical rotations. Student's clinical skills will also be reassessed upon return from LOA, and additional time may be needed to re-establish clinical competency levels. Time lost due to LOA must be made up before the student will be eligible to graduate from the Schools of Medical Imaging and before the student is eligible to take the credentialing examination.

### **Pregnancy Policy for Nuclear Medicine and Radiography Program**

The following policy is based on the Nuclear Regulatory Commission's Regulatory Guide 8.13. A complete copy of this guide is available in the program offices.

If, during the course of her clinical training, a student becomes pregnant, she is strongly encouraged to declare this pregnancy to the program director. Revealing a pregnancy is not required but is the decision of the student. The student who chooses to reveal her pregnancy to the program director will:

- Submit a formal statement in writing to the program director. A sample letter is available in the program office.

- Receive counseling on radiation safety practices to be observed during the course of her pregnancy from the program director, the chief physicist, or the radiation safety officer.
- Receive a fetal radiation monitor, which is to be worn at waist level, and when applicable, *under* the lead apron (for Radiography).
- Revealing a pregnancy allows for monitoring fetal dose to determine the fetal dose does not exceed 0.5 rem.
- This limited radiation dose will begin when the pregnancy is declared.

The student must be aware of the following:

- Only declared pregnancies are subject to the lower dose limit.
- The program will assume that a pregnancy does not exist unless the program director is informed of the pregnancy in writing.
- If a student has declared a pregnancy, the student has the right to withdraw the declaration of pregnancy at any point in time. A withdrawal of declaration of pregnancy must also be in writing.

Pregnant students in the Nuclear Medicine Technology and Radiography program have several options regarding the program. Once the pregnancy is declared, the program faculty will discuss the following options with the student.

The options are as follows:

1. The student may continue both academic and clinical components of the program with no interruption.
2. The student may continue academic course work only. Students seeking this option must have a written communication from their health care provider stating that this is necessary for the safety of the pregnancy. This option is at the discretion of the program director and will depend on the student's place in the program. Students who select this option with the program director's approval will make up all clinical training prior to graduation and receiving a certificate of program completion.
3. Leave the program and re-enter the program at an appropriate time to be determined by the program director. The student may be required to begin the program again, depending on the student's place in the program at the time of withdrawal. The maximum leave of absence within an 18-month period is 60 days.

Students who select options 2 or 3 may only re-enter the program if student enrollment does not exceed JRCERT or JRCNMT mandated capacity, or if a waiver is obtained for student capacity.

Regardless of which option is chosen, the student must complete all academic and clinical requirements in a satisfactory manner prior to receiving a certificate from The Johns Hopkins Hospital Schools of Medical Imaging. The student should be aware that this might entail additional

clinical training if the absence from clinical training has been substantial, or if clinical skills need further enhancement.

### **Inclement Weather Policy**

In the event of inclement weather, the Schools of Medical Imaging will remain open. If the student is unable to attend due to inclement weather, the student must use time from their bank of hours and will incur an occurrence. In the event that classes are canceled, the instructor will email the students by 6:00 am if the classes for that day will be online. Otherwise, the student is expected to attend classes in person. Failure to attend class will result in time being removed from the student's bank of leave time.

### **Disciplinary Policies**

The JHH Schools of Medical Imaging has developed a disciplinary policy to inform students of undesirable behavior, which allows students to correct such behavior and bring performance to an acceptable level. The student may be given, in order of severity, counseling, written citation, written warning, probation and dismissal.

Depending on the nature of the infraction, breach of a disciplinary policy may result in probation and ultimately dismissal from the program if the problem is not resolved. However, breach of a critical or a major disciplinary policy may result in immediate dismissal without the benefit of a written probation. This will occur in an instance where patient safety or ethical issues are involved, or radiation safety is compromised. Documentation will be retained in the student's file at every level of the disciplinary process. It is the prerogative of the program faculty to identify and to determine the appropriate level of the disciplinary process depending on the nature of the infraction.

### **Dismissal**

A student who is being dismissed from the program has generally been issued a written probation. If the stipulations of the written probation have not been accomplished, the student will be dismissed from the program. Clinical dismissal from the program is permanent and does not allow for reapplication to the program. Academic dismissal does allow the student to reapply to the program and may require the applicant to take additional classes at the discretion of the program director. Instances involving patient safety, ethical issues, radiation safety, violations of HIPAA policies or breach of a critical program disciplinary policy may result in immediate dismissal with no written probation. A student who is being dismissed will receive a written notice and conference with the program faculty. A student may be dismissed from the program at any time.



Reasons for dismissal may include but are not limited to:

- The student's clinical or academic records are unsatisfactory.
- The student is absent for three consecutive days without prior notification of the program faculty.
- The student has committed a breach of a major or critical rule or regulation of The Johns Hopkins Hospital, Department of Radiology, or Schools of Medical Imaging. This will also include a breach of policies, rules or regulations from affiliate clinical sites.
- Failure to comply with any HIPAA policies.
- The student has failed to comply with a previous probation or has incurred a second probation for a different reason.
- The student displays an antagonistic disposition or any other undesirable trait, making them unsuitable for the field of medical imaging.
- Failure to adapt to any program requirements.
- Reporting to the Program while under the influence of any intoxicant, hallucinogenic or narcotic or where the presence of any such agent can be established by a "for cause" drug test under the Substance and Alcohol policy.
- Unauthorized possession or use of an intoxicant, hallucinogenic or narcotic while on the premises.
- Failure to submit to an alcohol or drug screening.
- Unauthorized possession of a deadly weapon on the premises.
- Fighting, issuing threats or verbal abuse or other disorderly conduct on the premises, or while otherwise engaged in Hopkins or affiliate site's business.
- Exposing an OSL badge on purpose.
- Taking unauthorized photographs or recording patient information or images.
- Theft or unauthorized possession of any Hopkins' or affiliate site's property, or willingly causing damage to, waste of, or loss of property.
- Falsification of records.
- Failure to abide by the academic integrity policy.
- Performance of any imaging procedure without a physician's request or without charge to the patient.
- Failed clinical rotations may result in dismissal.

### **Grievance Policy**

All students have the right to appeal administrative decisions made by faculty and staff of the Schools of Medical Imaging. The student must follow the levels as listed below, in the order that they are listed. Any attempt to bypass a level of the process, will result in termination of the appeal process. *Before the grievance policy may be initiated at Level One, the student is required to meet with the other party in an attempt to rectify the*

*situation.* If the perceived grievance is not rectified through a meeting, the formal process of appeal, as detailed below, includes two levels. All students have the right to appeal administrative decisions made by the faculty of the Schools of Medical Imaging. The student must follow the levels below, in the order they are listed. Any attempt to bypass a level of the process will result in termination of the appeal process. Once a disciplinary action has taken place at the program level, the student may wish to pursue the matter through the grievance process.

#### Level One

The student must provide a written statement to the Director of the Schools of Medical Imaging within three (3) working days of the incident. The statement must fully describe the circumstances giving rise to the grievance and a description of the efforts that have been made to resolve the grievance. A decision regarding this appeal will be made within three (3) working days of receiving the grievance, exclusive of weekends, holidays, scheduled or unscheduled absences or sick days. The written response to the student at Level One will provide contact information for the grievance committee at Level Two, should the student wish to pursue the matter further.

#### Level Two

If the student desires to appeal the decision made at Level One, the student must present the grievance within three (3) working days of the decision at Level One to a panel of persons outside of the Schools of Medical Imaging and the department of Radiology. The student must present a written statement to the chairperson of the committee, who will contact other members of the committee. This statement must fully describe the circumstances giving rise to the grievance and a description of the efforts made to resolve the grievance at the previous level. Those persons responsible for hearing the grievance will discuss the circumstances surrounding the grievance with all interested parties and may ask for documentation from any party. Every effort will be made to resolve this issue within two weeks, exclusive of weekends, holidays, scheduled or unscheduled absences or sick days.

#### **Accreditation Body Appeals Process**

If the student believes that a violation of the accrediting body's standards has occurred, the student should first follow the steps of the program's appeals process. If the student believes that a violation still exists after following all the steps of appeals process, the student should contact the appropriate accrediting body.

The Diagnostic Medical Sonography Program:  
The Commission on Accreditation of Allied Health Education Programs  
(CAAHEP)  
1361 Park Street  
Clearwater, FL 33756  
Phone: (727) 210-2350  
410-764-4777  
Fax: (727) 210-2354  
<http://www.caahep.org/>

The Nuclear Medicine Technology Program:  
The Joint Review Committee on Education in Nuclear Medicine Technology  
820 W. Danforth Road #B1  
Edmund, OK 73003  
405-285-0546  
mail@jrcnmt.org

The Radiography Program:  
The Joint Review Committee on Education in Radiologic Technology  
20 N. Wacker Drive, Suite 2850  
Chicago, IL 60606-3182  
312-704-5300  
www.jrcert.org  
Reference Program #2545

Once the complaint has been filed with the accrediting body, and the program has been contacted by the accrediting body, the program will:

1. Inform the Advisory Board, Director of the Medical Imaging Schools, and Radiology Administration that a formal complaint was filed with the accrediting body.
2. Review the complaint with program faculty and the Director of the Medical Imaging Schools, and offer complete written explanation to above named parties, and the accrediting body as to the events that have occurred. All previous attempts at solving the problem will be outlined. The response will be issued within 10 days of receipt of the complaint.
3. Based on this explanation, the accrediting body will decide whether or not the program is in compliance with the Standards.
4. If the accrediting body believes that the program is not in compliance with the Standards after written explanation, the program will comply with directives issued by the accrediting body to bring the program into compliance. Members of the program's advisory board will meet to develop a plan of action for resolution of the decree of non-compliance. All means of complying with directives will be forwarded to the accrediting body within the indicated time frame.

The person(s) who has issued the complaint will be informed of the progress toward resolving the issue.

The student also has the right to contact the following agencies.

**Maryland Higher Education Appeals Process**

The student has the right to appeal in writing to the Secretary of Higher Education at the Maryland Higher Education Commission concerning possible school violations of Maryland regulations. Maryland Higher Education policies require that all steps of the program grievance policy be initiated before contacting MHEC.

Maryland Higher Education Commission  
6 North Liberty Street  
Baltimore, MD 21201  
410-767-3301

The student also has the right to contact:

**Maryland Board of Physicians**

4201 Patterson Avenue  
Baltimore, MD 21215  
400-764-4777

**Maryland State Consumer Protection Agency**

200 St. Paul Street  
Baltimore, MD 21202  
410-576-6372

## Diagnostic Medical Sonography

### Grading Policies

Students must complete all academic coursework with a grade of 75% or better and all clinical coursework with a grade of 84% or better. Students who fail an academic or clinical course will be dismissed from the program.

### Diagnostic Medical Sonography Curriculum Outline

Subject	Lecture Hours	Scan Lab Hours	Clinical Hours
Introduction to Medical Imaging and Sonography Didactics	200		
Patient Care Didactics	14		
Abdominal Didactics	98		
Superficial Structures Didactics	32		
Abdomen and Superficial Scan Labs		116	
Clinical Practicum I			565
Sonographic Principles and Instrumentation Didactics	40		
Ethics and Professionalism Didactics	14		
Obstetrics and Gynecology Didactics	156		
Breast Didactics	32		
Breast and Gynecology Scan Labs		80	
Clinical Practicum II			488
Vascular Didactics	96		
Pediatrics, Miscellaneous & Interventional Didactics	54		
Professional Presentation	16		
Vascular Scan Labs		56	
Clinical Practicum III			1007

**Total Program Instructional Hours: 3064 Hours**

### Diagnostic Medical Sonography Course Descriptions

#### Semester One

**Introduction to Medical Imaging and Sonography** Instructor: Carol Iversen, Edward Yuhanna

This course provides an orientation to the clinical aspects of Medical Imaging in a Hospital environment for students without significant previous experience in clinical health care. It includes:

1. An introduction to each specialty with emphasis is on the basic orientation to a Hospital Radiology Department, its function, and basic

patient care techniques. Students will assist with routine sonographic procedures.

2. An introduction to customer service skills including professional behavior in the medical environment, hospital as well as private office, staff-patient interpersonal skills, oral communication and body language, and respect for cultural differences.
3. An introduction to blood-borne pathogen training, cardiopulmonary resuscitation training (American Heart Association – BLS –Healthcare Provider), infection control, and body mechanics for safe patient transport
4. An introduction to cross sectional anatomy of the head, thorax, abdomen and pelvis including vasculature, abdominal musculature, abdominopelvic spaces, and peritoneal reflections.
5. An introduction to pathology including neoplasms, fluid collections, abscesses, lymphatic system pathology, and aortic pathology.
6. An introduction to sonographic physics and equipment manipulation, sonographic procedures and protocols, and patient care techniques for sonographic specific examinations. The student will begin laboratory exercises in scanning techniques.

### **Patient Care**

Instructor: Carol Iversen, Edward Yuhanna

Included in this course are nursing care procedures, customer service skills and professional behavior in a variety of medical environment. Also included are staff-patient interpersonal skills, oral communication and body language, work-related musculoskeletal injuries, and respect for cultural differences. Also covered are patient rights and responsibilities, confidentiality, privacy issues and ethical situations.

### **Abdominal Didactics**

Instructors: Carol Iversen, Edward Yuhanna

An overview of the sonography department and an introduction to clinical training where the student is introduced to basic principles of patient care followed by a correlated sequence of topics involved in abdominal and male pelvic sonography including: sectional anatomy, physiology, pathophysiology, scanning techniques, normal and abnormal sonographic representations of anatomy and correlation with other imaging modalities. Laboratory demonstration and student practice in scanning techniques and protocol related to the various abdominal structures are also included.

### **Superficial Structures Didactics**

Instructors: Carol Iversen Edward Yuhanna

Introduction to sonographic techniques and procedures involved in anatomically small and/or superficial structures including the thyroid, scrotum/testicles, prostate and miscellaneous GI topics. Included is sectional

and sonographic anatomy of these structures, scanning equipment and techniques, sonographic representation of pathology, and correlated radiographic imaging. Course includes laboratory demonstration and practice in these procedures.

### **Clinical Practicum 1**

Instructors: DMS Clinical Instructors

1. A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound examinations and procedures primarily involving structures of the abdomen and male pelvis as presented in abdominal ultrasound.
2. A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound examinations and procedures primarily involving and small and/or superficial structures as presented in class.

### **Semester II**

#### **Sonography Principles and Instrumentation**

Instructors: Edward Yuhanna

Fundamental principles of acoustical physics including sound wave generation and propagation in tissue; factors affecting acoustical impedance and reflection; transducer design, characteristics, and construction and principles of Doppler ultrasound. A wide array of ultrasonic instruments and transducers are presented as well as the appropriate operation of principle controls of each. Quality Assurance and safety issues are also discussed. Laboratory demonstration and student practice in scanning techniques and protocol related to the various abdominal structures are also discussed.

#### **OB/GYN Didactics**

Instructors: Carol Iversen, Edward Yuhanna, Kristen Beckman

A correlated sequence of topics involved in obstetrics and gynecological sonography including sectional anatomy, physiology, normal and abnormal fetal development. Scanning techniques and protocols as appropriate for fetal development including measurements and fetal age estimates are stressed. This course includes both laboratory demonstration and practice in scanning techniques related to imaging these systems.

#### **Breast Didactics**

Instructor: Carol Iversen

Introduction to sonographic techniques and procedures involved in scanning the breast. Included are sectional and sonographic anatomy of the breast, scanning equipment and techniques, sonographic representation of

pathology, and correlated radiographic imaging. Course includes laboratory demonstration and practice in these procedures.

### **Ethics and Professionalism Didactics**

Instructor: Carol Iversen

Didactic instruction will include discussions and assignments related to professionalism, HIPAA, Scope of Practice, critical thinking, bioethics, and medicolegal issues in the Sonography profession. This course includes various media, independent study and will also involve readings, class debates and discussions and essay assignments which are pertinent to the course being taught.

### **Clinical Practicum II**

Instructors: DMS Clinical Instructors

1. A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound examinations and procedures primarily involving gynecology and obstetrics as presented in class. Students also continue to perform routine abdominal and superficial structures under limited supervision during this time.
2. A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound examinations and procedures primarily involving the breast as presented in class.

### **Semester III**

#### **Vascular Didactics**

Instructor: Edward Yuhanna

This course is an introduction to sonographic imaging in vascular Doppler. This includes spectral Doppler, color Doppler and power Doppler imaging of various abdominal, cerebral, and peripheral vascular systems. Included is sectional and sonographic anatomy of these structures, scanning equipment and techniques, sonographic representation of pathology, and correlated radiographic imaging. Course includes laboratory demonstration and practice in these vascular procedures.

#### **Pediatrics, Miscellaneous and Interventional Ultrasound Didactics**

Instructors: Edward Yuhanna

This course is an introduction to sonographic imaging in pediatric and interventional ultrasound. This includes neonatal neurosonography, pediatric hip and spine, pediatric genitourinary tract and pediatric and miscellaneous gastrointestinal tract ultrasound. This course also covers interventional ultrasound such as ultrasound-guided organ biopsy, thoracentesis, paracentesis, cyst aspiration, and advanced in contrast ultrasound imaging. Included are sectional and sonographic anatomy of pediatric brain, hip, and spine, the gastrointestinal tract, prostate and



seminal vesicles, and the thorax. Lectures discuss scanning equipment and techniques, sonographic representation of pathology, and correlated radiographic imaging. Course includes continued laboratory demonstration and practice in vascular procedures.

### **Professional Presentation/Extended Clinical Practicum**

Instructors: Carol Iversen, Edward Yuhanna

Students are introduced to academic research techniques, professional development, and proper formal presentation technique. For their lecture presentation, students will choose an ultrasound related topic from an approved list of topics published by the program director. Students also continue to perform routine abdominal, OB-GYN, superficial structures, breast, vascular and pediatric sonographic examinations under limited supervision during this time. Weekly seminars with instructional staff are also included.

### **Clinical Practicum III**

Instructors: DMS Clinical Instructors

1. A practicum that enables the student to learn and perform, under close supervision, selected spectral Doppler and color Doppler examinations of the abdominal, cerebral, breast and peripheral vascular systems. Students also continue to perform routine abdominal, OB-GYN and superficial structures under limited supervision during this time.
2. A practicum that enables the student to observe, learn and perform under close supervision, selected pediatric procedures and to primarily observe selected interventional procedures.

### **Diagnostic Medical Sonography Clinical Sites**

- The Johns Hopkins Hospital and The Johns Hopkins Hospital Outpatient Center
  - Pediatrics
  - Maternal Fetal Medicine
  - Avon Breast Center
- The Johns Hopkins University Department of Vascular Surgery
- Johns Hopkins Bayview Medical Center
- Johns Hopkins Medicine, Howard County General Hospital Johns Hopkins Medicine, Sibley Memorial Hospital and Suburban Hospital
- Johns Hopkins Imaging: GreenSpring & White Marsh
- Anne Arundel Diagnostics
- MedStar Franklin Square
- Medstar Union Memorial
- Mercy Medical Center
- Sinai Hospital of Baltimore
- University of Maryland Medical Center

- Greater Baltimore Medical Center

### **Program Hours**

Program hours for the Diagnostic Medical Sonography will vary. On the days when scan labs are scheduled, the hours are 6:30 am to 3:00 pm. Scan labs are held multiple days per week, primarily Monday, Tuesday and Wednesday, but the program reserves the right to vary these days. On days when scan labs are not scheduled the hours are 8:00 am to 4:30 pm.

### **Certification Examinations**

The JHH DMS curriculum is currently accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) as a "General Sonography" program. The national certification examinations are administered by the American Registry of Diagnostic Medical Sonography (ARDMS).

Students are required to take and pass the ARDMS Sonographic Principles and Instrumentation examination plus either Abdomen or Obstetrics and Gynecology before graduation. Students are strongly encouraged to take all three examinations before graduation.

Once graduates are registered in general sonography (RDMS), they will be able to apply and sit for other examinations administered by the ARDMS under ARDMS re-applicant status.

Students may also be certified in Sonography by completing the certification offered by the American Registry of Radiologic Technologists.

## Nuclear Medicine Technology

### Grading Policies

Students must complete all academic coursework with a grade of 75% or better and all clinical coursework with a grade of 84% or better. Students who fail an academic or clinical course will be dismissed from the program.

### Nuclear Medicine Technology Curriculum Outline

Subject	Lecture Hours	Lab Hours	Clinical Hours
NMED 101: Introduction to Medical Imaging	100	20	
102: Patient Care and Pharmacology	35	8	
NMED103: Medical Ethics and Law for the Imaging Professional	16		
NMED 104: Introduction to NMED Procedures	54		
NMED 105: Radiation Biology and Safety	46		
NMED 106 Clinical Practicum I			875
NMED 201: Nuclear Physics and Instrumentation	36		
NMED 202: Radiopharmacology	54	40	
NMED 203: Advanced Instrumentation	45		
NMED 204: Clinical Applications of Radionuclides	54		
NMED 205: Clinical Practicum II			766
NMED 301: CT Principles and Instrumentation	40		
NMED 302: Cross-Sectional Anatomy	40		
NMED 303: CT Protocols and Applications	40		
NMED 304: Clinical Practicum III			795

**Total Hours of Program Instructional Hours: 3064**

### Nuclear Medicine Technology Course Descriptions

#### Semester I

#### **NMED 101 Orientation and Introduction to Nuclear Medicine Technology**

Instructor: Nuclear Medicine Program Director

This course is an introduction to the clinical aspects of nuclear medicine technology in the hospital and outpatient environment. Emphasis is on the basic orientation to the nuclear medicine division, its function, and basic

patient care techniques. Students will observe and assist with routine nuclear medicine procedures in this course. Venipuncture skills will be taught and evaluated.

It also includes several days of basic orientation: a review of policies and procedures, a hospital tour, history of the hospital and school, introduction to staff, administration, and instructors. Lectures will also include a history of the hospital system, organization of the department, areas of clinical specialties and others. In addition, all students will complete the required CPR training (American Heart Association – BLS –Healthcare Provider). Basic hospital orientation consists of 1 day of mandatory hospital training.

### **NMED: 102: Patient Care and Pharmacology**

Instructor: Allison Mason, BS, RT(R)

This course will provide a basic understanding of the skills needed to allow the student to work comfortably and safely with patients. Some of the areas covered will include standard precautions, infection control, proper body mechanics, patient transport techniques, aseptic technique, communication, age-specific criteria, basic nursing care, and patient monitoring to include vital signs and medical emergencies. Pharmacology and the use of radiographic contrast, including risk factors and reactions, will also be taught. Students will learn to critically evaluate patients and examinations to determine possible risks to the patient or staff. The course will also include a clinical component under the supervision of a radiology nurse.

### **NMED 103: Ethics and Law for the Imaging Professional**

Instructor: Program Director

The purpose of this course is to give the medical imaging student a basic background in ethics, medical-legal issues and ethical decision-making. The field of medical imaging is one where students will be called upon to make decisions that will involve personal and professional ethics and values. This course will be taught as a combination of lecture and class discussion. Student contribution to class discussion is important to this course.

### **NMED 104: Introduction to Nuclear Medicine Procedures**

Instructor: David Kelkis, BS, CNMT

This course is designed to provide the student with a basic understanding of the various procedures employed in the practice of laboratory and clinical Nuclear Medicine. The use of nuclear medicine technology in all body systems is covered.

### **NMED 105: Radiation Protection and Radiation Safety**

Instructor: Sandra Moore, MA, RT(R)

This course is designed to acquaint the student with the effects of ionizing radiation on the human body, and optimizing radiation protection for

patients, self and other healthcare providers. The first half of the course will focus on radiation biology and covers such concepts as ALARA, ionizing radiation interaction with matter, and early and late effects of ionizing radiation. The second half of the course will focus on means of minimizing radiation exposure to both patients, imaging technologists and other health care workers. Also covered are regulations related to radiation exposure and nuclear medicine equipment. This course will focus on means of minimizing radiation exposure to both patients, imaging technologists and other healthcare workers. Also covered are agencies and regulations related to radiation exposure and nuclear medicine equipment.

### **NMED 106: Clinical Practicum I**

Clinical practice enables the student to work with patients while under close supervision of a qualified technologist. This allows the student to use knowledge gained in the classroom in hands-on application.

## **Semester II**

### **NMED 201: Nuclear Physics and Instrumentation**

Instructor: Program Director

This course is designed to provide the student with a basic understanding of the process and products of radioactive decay, the theory of operation, practical limitations, and selection of radiation detection equipment. The application to problems in Nuclear Medicine is emphasized.

### **NMED 202: Radiopharmacology**

Instructor: Program Director

This course is designed to provide the student with an understanding of the principles and practice concerning with the use of radiopharmaceuticals.

### **NMED 203: Advanced Instrumentation**

Instructor: David Kelkis, BS, CNMT

This course focuses on SPECT, PET, computer applications and image processing.

### **NMED 204: Clinical Applications of Radionuclides**

Instructor: Program Director

A consideration of the rationale and technical details of the diagnostic tests performed in a Nuclear Medicine clinic. Included are descriptions of the abnormal anatomy and/or physiology that tests are designed to reveal, together with a consideration of the criteria for a technically and diagnostically satisfactory test. This course requires a research project and presentation.

### **NMED 205: Clinical Practice II**

Extension of Clinical Practice I, this course provides experience for the student in various areas of clinical Nuclear Medicine. Students continue to apply concepts learned in the classroom and apply these concepts to practical applications in Nuclear Medicine while under the direct and indirect supervision of a qualified technologist.

### **Semester III**

#### **NMED 301 – Computed Tomography Principles & Instrumentation,**

Instructor: Vince Blasko, BS, RT(R)(CT)

This course teaches the physics, image quality control factors, and equipment considerations of CT. Topics include the historical development of CT scanners; factors affecting CT resolution and noise; CT reconstruction algorithms and filters; window width and level controls; tissue density issues; image display parameters; and radiation dose issues. Students also study dynamic CT with contrast enhancement, spiral CT, and 3D CT reconstruction. Current generation CT scanning technology is described and the relative advantages of different systems are compared.

#### **NMED 302 – Cross-sectional Anatomy,**

Instructor: J. Scott Graves, RT(R)(CT)

This course is designed as a survey of human anatomy and selected pathology from a regional rather than system perspective. Students will become accustomed to viewing anatomy of regions of the body in the different anatomical planes typically produced in cross-sectional imaging. Special emphasis will be placed upon correlating and recognizing anatomical structures as they appear on medical images produced with CT, MRI, nuclear medicine, and ultrasound. Primary regions of interest include head, thorax, abdomen, and pelvis.

#### **NMED 303 – Computed Tomography Protocols & Applications,**

Instructor: Various certified CT technologists

This course is a survey of routine CT imaging procedures. The content is divided into three units: (1) head, neck and spine, (2) chest and abdomen, and (3) pelvis and extremities. The student also becomes familiar with contrast administration guidelines and timing issues related to dynamic imaging. Spiral CT, 3D reconstruction procedures, and vascular imaging are discussed and compared with routine imaging of the same anatomical regions.

#### **NMED 304 – Clinical Practicum III**

This clinical course will allow the student to achieve final competencies in Nuclear Medicine studies and complete CT competencies. Students gain hands-on experience with different types of CT imaging equipment and procedures typically performed on that equipment. Students are expected to

master the techniques for each category of CT procedures and will be required to demonstrate competency for a range of routine procedures.

### **Nuclear Medicine Clinical Training Sites**

- The Johns Hopkins Hospital and Outpatient Center
- Johns Hopkins Bayview Medical Center
- Sinai Hospital of Baltimore
- MedStar Hospital at Franklin Square
- Baltimore Washington Medical Center
- Chesapeake Medical Imaging
- St. Agnes Hospital
- Anne Arundel Medical Center
- Triad Isotopes

### **Certification Information**

Students who graduate from the Nuclear Medicine Technology Program are eligible to sit for the following board examinations:

- NMTCB (Nuclear Medicine Technology Certification Board)
- ARRT (American Registry of Radiologic Technology)

Students are also eligible upon graduation to sit for the CT board examinations in each of the above-named certification boards.

### **Program Hours**

Program Hours for the Nuclear Medicine Technology Program are generally 8:00 am to 4:30 pm. When the student is assigned to a Quality Control rotation, the hours will be 6:30 am to 3:00 pm. There will be one week of overnight rotation at a local nuclear pharmacy location where the hours are 11:00 pm to 7:30 am.

## Radiography

### Grading Policies

Students must complete all academic coursework with a grade of 75% or better and all clinical coursework with a grade of 2.5 or better on a 4.0 scale. Students who fail an academic or clinical course will be dismissed from the program.

### Radiography Curriculum Outline

Curriculum Outline	Lecture Hours	Lab Hours	Clinical Hours
Rad 101: Orientation and Introduction to Radiography	93	24	23
Rad 102: Radiographic Procedures I	50	16	
Rad 103: Equipment Operation	30		
Rad 104: Radiation Biology and Protection	20		
Rad 105: Image Acquisition and Evaluation I	14		
Rad 106: Patient Care and Pharmacology	35	8	
Rad 107: Osteology	28		
Rad 108: Medical Terminology	30		
Rad 110: Clinical Practicum I			774
Rad 202: Radiographic Procedures II	40	12	
Rad 203: Medical Ethics and Law for the Imaging Professional	22		
Rad 204: Equipment Operation and Quality Control	20		
Rad 205: Image Acquisition Evaluation II	30	4	
Rad 206: Venipuncture Training	8	8	
Rad 220: Clinical Practicum II			806
Rad 302: Imaging Modalities and Radiation Therapy	24		
Rad 303: Comprehensive Registry Review	40		
Rad 304: Introduction to Radiographic Pathology	34		
Rad 305: Advanced Topics in Radiography	28		
Rad 330: Clinical Practicum III			810
	575	76	2,413

**Total Program Instructional Hours: 3064**

### Course Descriptions



## **Semester I**

### **RAD 101 Orientation and Introduction to Radiography**

Instructors: Stacey Bickling, Allison Mason

This course is designed to provide the student with an overview of radiography, and its role in the health care delivery system. Policies and procedures of the program will be covered. The organization of the hospital and the radiology department will be explained. The student will be oriented to the profession of radiography in relation to various accreditation and credentialing agencies. An overview of other allied health care professions will be covered. Professional opportunities for growth and development will be discussed. Lecture content will also include training related to cultural competencies and critical thinking. Clinical orientation will cover basic operation of the x-ray unit, image processing and radiation protection. Terms and concepts that are basic to radiographic procedures will be introduced. Attendance at a hospital employee orientation session will train the student in handling blood and bodily fluid borne pathogens, harassment, chemical and fire safety. The student will receive training for CPR certification. Coursework will be assigned in the JHH online learning system. The student will be expected to pass both clinical and classroom competency evaluations related to this course

Successful completion of this pre-clinical course is a pre-requisite for continuing in the radiography program.

### **RAD 102 Radiographic Procedures I**

Instructor: Stacey Bickling

This course, the first of a two-semester sequence, provides detailed instruction in the fundamental principles of positioning for all routine radiographic procedures. It includes relevant topographic anatomy and cross-sectional anatomy instruction. Also included in this course is an instruction in procedures that are unique to pediatrics, geriatrics, obesity, mobile radiography, trauma and operating room. This course integrates with the Clinical Competency Program. This course is divided into categories with each category having a laboratory component. The categories are chest, abdomen, extremities, pelvis, and the bony thorax. Emphasis is placed on critical evaluation of images and problem-solving skills about producing diagnostic radiographs.

### **RAD 103 Equipment Operation**

Instructor: Stacey Bickling

In this course, commonly called Radiation Physics, the first semester radiography student will be introduced to the fundamental principles of ionizing radiation. During the course of this semester, the student will be presented with material covering the discovery of X-ray, X-ray properties, X-

ray terminology, Electricity and Magnetism, Electromagnetic Radiation, the X-ray unit and tube, X-ray production, and X-ray emission spectrum.

### **RAD 104 Radiation Biology and Protection**

Instructor: Stacey Bickling

This course is designed to acquaint the student with the effects of ionizing radiation on the human body, and optimizing radiation protection for patients, self and other healthcare providers. The first half of the course will focus on radiation biology and covers such concepts as ALARA, ionizing radiation interaction with matter, and early and late effects of ionizing radiation. The second half of the course will focus on means of minimizing radiation exposure to both patients, imaging technologists and other health care workers. Also covered are regulations related to radiation exposure and x-ray equipment. This course will focus on means of minimizing radiation exposure to both patients, imaging technologists and other healthcare workers. Also covered are agencies and regulations related to radiation exposure and x-ray equipment.

### **RAD 105 Image Acquisition and Evaluation I**

Instructor: Allison Mason

This course, the first in a two-semester sequence, will provide students with the principles of image creation. The primary focus of this course will be the process of digital imaging to include characteristics, image identification, computed radiography, direct digital radiography, image processing and display, as well as information about RIS, DICOM and PACS.

### **RAD 106 Patient Care and Pharmacology**

Instructor: Allison Mason

This course will provide a basic understanding of the skills needed to allow the student to work comfortably and safely with patients. Some of the areas covered will include standard precautions, infection control, proper body mechanics, patient transport techniques, aseptic technique, communication, age-specific criteria, basic nursing care, and patient monitoring to include vital signs and medical emergencies. Pharmacology and the use of radiographic contrast, including risk factors and reactions, will also be taught. Students will learn to critically evaluate patients and examinations to determine possible risks to the patient or staff. The course will also include a clinical component under the supervision of a radiology nurse.

### **RAD 107 Osteology**

Instructor: Stacey Bickling

This course will provide detailed content in the subject of human osteology. Information will cover the structure and function of bone tissue. Students will learn to identify bones using various instructional means such as dry specimens, drawings and radiographs. Emphasis will be placed throughout

the course on arthrology of various joints. This course integrates with Radiographic Positioning and the Clinical Competency Program to prepare the student to identify various bony anatomy on radiographs.

### **RAD 108 Medical Terminology**

Instructor: Stacey Bickling, Allison Mason

This course will provide the student with a sound background in the language of the medical profession. The content will be based on word-building skills that begin with a study of prefixes, suffixes and root words. Specific terminology related to radiology will be discussed. Also included in this course will be abbreviations and symbols. An ability to break down and analyze words, correct spelling and pronunciation will be emphasized.

### **RAD 110 Clinical Practicum I**

This clinical course will introduce the radiography student to the day-to-day operations of clinical practice. The first part of the course will be spent introducing the student to the clinical area and assisting the technologist. Students may then begin performing radiographic procedures on patients under the direct supervision of a qualified technologist. Latter portions of the course will allow the students to begin documenting and testing on procedures that have been presented in the Radiographic Procedures I, once clinical laboratory and classroom testing have been completed.

## **Semester II**

### **RAD 202 Radiographic Procedures II**

Instructor: Stacey Bickling

This course will continue to provide students with detailed instruction on increasingly difficult radiographic examinations to include; spine, headwork, contrast imaging, genito-urinary studies, venography, arteriography, arthrography, myelography and hysterosalpinography. It includes relevant topographic anatomy and cross sectional anatomy instruction. Continued emphasis will be placed on critical evaluation of images and problem-solving skills in relation to producing diagnostic radiographs. This course integrates with the Clinical Competency Program and is divided into categories, each having its own laboratory component.

### **RAD 203 Medical Ethics and Law for the Imaging Professional**

Instructor: Stacey Bickling

The purpose of this course is to give the medical imaging student a basic background in ethics, medical-legal issues and ethical decision-making. The field of medical imaging is one where students will be called upon to make decisions that will involve personal and professional ethics and values. This course will be taught as a combination of lecture and class discussion. Student contribution to class discussion is important to this course.

### **RAD 204 Equipment Operation and Quality Control**

Instructor: Stacey Bickling

Equipment Operation and Quality Control will cover the following topics:

This course, a continuation of Equipment Operation, will cover the operation of different equipment that uses X-radiation to produce images. This course will include lectures on fluoroscopy, both analog and digital, mammography, tomography, subtraction, and CT equipment.

### **RAD 205 Image Acquisition and Evaluation II**

Instructor: Allison Mason

This course allows the student to develop working knowledge of the theory and principles of radiographic exposure. The four primary image quality factors of detail, distortion, brightness, and contrast will be covered.

Controlling and influencing factors that affect radiographic quality are emphasized. Critical thinking and problem-solving skills will be emphasized as the student learns to manipulate various controlling and influencing factors of radiographic quality to produce an optimal radiograph.

### **RAD 206 Venipuncture**

Instructors: Stacey Bickling, Sandra Moore, Allison Mason

This non-graded course will be successfully completed when the student is certified in venipuncture by the Radiology Department. The student will participate in a series of classroom demonstrations and practice. The student will complete a self-learning packet of materials required by the Radiology Department for all technologists, nurses, and students who wish to practice venipuncture in the department. The student will prove competency by passing a clinical practicum with a radiology nurse.

### **RAD 220 Clinical Practicum II**

This clinical course will allow the student to perform radiographic examinations under the supervision of a qualified radiographer. The students will continue documenting and testing on studies that have been presented in Radiographic Procedures II, once clinical laboratory and classroom testing has been completed. Emphasis will be placed on continued improvement of imaging skills and speed in performing examinations.

## **Semester III**

### **RAD 302 Imaging Modalities and Radiation Therapy**

Instructors: Allison Mason, Various Specialty Area Staff

This course provides an overview of alternate imaging modalities including: Cardiovascular – Interventional Imaging, Neuro-Interventional, Computed Tomography, Nuclear Medicine Technology, DEXA, Diagnostic Medical Sonography, Mammography and Magnetic Resonance Imaging, and Radiation Therapy. Included in the discussions of these alternate imaging modalities will be necessary requirements to become certified in the areas

### **RAD 303 Comprehensive Review**

Instructors: Stacey Bickling, Allison Mason, Sandra Moore

This non-graded course is intended to prepare the student for the ARRT Registry Exam in Radiography. The content areas correspond to those content areas of the registry exam. Students will review content, practice exam questions, and have the opportunity to direct the review content to specific areas they determine to be necessary.

### **RAD 304 Introduction to Radiographic Pathology**

Instructor: Allison Mason

This course is designed to enable the second-year radiography student to integrate information learned from courses in radiographic positioning and anatomy into evaluating pathological processes diagnosed from radiographs. Commonly seen pathologies will be discussed, and their radiographic appearance demonstrated. Included in this course will be the formal presentation of a project that has been independently researched by the student.

### **RAD 305 Advanced Topics in Radiography**

Instructor: Stacey Bickling

This course is designed for extensive group and individual participation in the critical evaluation of radiographs, typical and atypical radiographs, procedures and imaging the non-conforming patient. The student is guided by the instructor in using critical thinking skills to identify problems in regard to diagnostic quality of the radiograph. Anatomical structures, associated pathology, positioning, processing problems and pertinent patient clinical data are discussed. This course will also include critical evaluation of journal and internet articles relevant to radiology. The student will create a clinical portfolio during this course.

### **RAD 330 Clinical Practicum III**

This clinical course will allow the student to perform radiographic examinations under the supervision of a qualified radiographer. The students will continue documenting and testing on studies that have been presented in Radiographic Procedures I and II. Emphasis will be placed on continuous improvement of imaging skills and speed in performing examinations. During

this clinical course, the student will be expected to complete all outstanding clinical competency testing, and complete three Global (terminal) competencies in the areas of Orthopedics, Emergency Department and General/Fluoroscopy.

### **Radiography Program Clinical Sites**

- The Johns Hopkins Hospital and Outpatient Center
- Johns Hopkins Imaging at White Marsh, Greenspring, and Columbia Orthopedics
- Johns Hopkins Bayview Medical Center
- Advanced Radiology at Annapolis, Timonium, Eldersburg and Westminster
- Lifebridge Health Centers at Sinai Hospital and Northwest Hospital

### **Certification Examination**

Upon completion of the Radiography Program and once the student has obtained an Associate's or Bachelor's degree, the student may sit for the certification board examination through the American Registry of Radiologic Technologists

### **Program Hours**

Radiography program hours are primarily 8:00 am to 4:30 am. The first rotation in the emergency department will be 10:00 am to 6:30 pm. The first rotation in pediatrics will be 7:00 am to 3:30. Subsequent rotations in the emergency department and pediatrics will be 1:00 pm to 9:00 pm. There are approximately eight weeks of evening rotations.