



The Johns Hopkins Hospital Schools of Medical Imaging
2008-2010

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
Radiology Administration Blalock B179
600 North Wolfe Street
Baltimore, Maryland 21287

Phone (410) 528-8208
Web page: [http:// radiologycareers.rad.jhmi.edu](http://radiologycareers.rad.jhmi.edu)
Fax: (410) 528-8308

Publish date: January 2008

**The Johns Hopkins Hospital
Schools of Medical Imaging
2008-2010**

Table of Contents

History.....	4
.....	
General	4
Information.....	
Accreditation.....	5
.....	
Administration and	5
Faculty.....	
Academic	7
Calendar.....	
Applications and	7
Admissions.....	
Tuition and Financial	9
Aid.....	
Resources and	10
Services.....	
Baccalaureate Degree	12
Options.....	
Program in	13
Radiography	
General	13
Description.....	
Curriculum	13
Outline.....	
Admission	14
Requirements.....	
Application.....	14
.....	
Program Fees and	14
Expenses.....	
Tuition.....	15
.....	
Course	15
Length.....	
Typical Daily	15
Schedule.....	
Clinical	15
Practicum.....	
Grading	15
Policy.....	
Radiography Course	16
Descriptions.....	
Program in Nuclear Medicine	19
Technology	
General	19
Description.....	
Curriculum	19
Outline.....	
Admission	20
Requirements.....	

Application.....	20
.....	
Program Fees and Expenses.....	20
Tuition.....	20
.....	
Course Length.....	21
Typical Daily Schedule.....	21
Grading Policy.....	21
Nuclear Medicine Technology Course Descriptions.....	21
Program in Diagnostic Medical Sonography.....	24
General Description.....	24
Curriculum Outline.....	24
Admission Requirements.....	25
Application.....	25
.....	
Program Fees and Expenses.....	25
Tuition.....	25
.....	
Course Length.....	26
Typical Weekly Schedule.....	26
Grading Policy.....	26
Diagnostic Medical Sonography Course Descriptions.....	26

Advanced Imaging Programs	29
Computed Tomography (CT)	29
General Description	
Curriculum Outline	
Computed Tomography Course Descriptions	
Magnetic Resonance Imaging (MRI)	31
General Description	
Curriculum Outline	
Magnetic Resonance Imaging Course Descriptions	
Mammography Program	33
General Description	
Advanced Imaging Programs General Information	34
Admission Requirements	
Application	
Program Fees and Expenses	
Course Length	
Grading Policy	
Administrative Policies	35
Attendance Policy	35
Inclement Weather Policy	35
Leave of Absence Policy	35
Academic and Clinical Progress Requirements	36
Requirements for Graduation	36
Grievances and Due Process	37
Right To Change Rules or Program Changes	37
Drugs and Alcohol Policy	37
Disclosure Statement for State Licensure	37
Release of Student Information Policy	37
Student Transcripts	37

Statement Regarding the Privacy Rights of Students

The Johns Hopkins Hospital Schools of Medical Imaging is 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 Director of the Programs.

Notice of Nondiscriminatory Policy as to Students

The Johns Hopkins Hospital Schools of Medical Imaging admits students of any race, color, sex, disability, and national or ethnic origin to all of the rights, privileges, program benefits and activities generally accorded or made available to students at the Schools of Medical Imaging.

Certified to be true and correct as of content:

Jay K. Rhine, BS, CNMT
Director
The Johns Hopkins Hospital Schools of Medical Imaging

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 uncle 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." And another 3.5 million dollars to build a joint university, "For there will always be youth." His concept of the Hospital and 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 this 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, 1889 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 in 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.

General Information

Mission

The mission of The Johns Hopkins Hospital Schools of Medical Imaging is to train imaging specialists of the highest caliber consistent with the standards and expectations of a graduate of The Johns Hopkins Medical Institutions.

Overview of Core Programs

The Johns Hopkins Hospital Department of Radiology offers three core programs in medical imaging. All of these core programs provide both theoretical training and practical hands-on clinical experience. The Medical Imaging Programs reflect a strong emphasis on clinical education with the aim to produce graduates for independent roles in health care. These core programs strive to maintain a high caliber of professionalism, and to teach technical competence in their selected field. Further career advancement could include advanced clinical specialization, management, marketing and equipment sales as well as educational positions.

The **Radiography** program is an 18-month course and the **Nuclear Medicine Technology** and **Diagnostic Medical Sonography** programs are 14 months in length. All of the medical imaging programs at The Johns Hopkins Hospital are full time. Students graduate with a certificate in their selected discipline and are eligible to take the national certification examinations in that discipline.

The Schools of Medical Imaging are owned by The Johns Hopkins Hospital and administered under the direction of the Radiologist-in-Chief of the Russell H. Morgan Department of Radiology and Radiological Sciences of The Johns Hopkins Hospital. Each program's faculty includes a full-time program director as well as clinical and support staff. The professional and technical staff of the Departments of Radiology of Johns Hopkins and the clinical affiliates provides didactic and clinical instruction.

The didactic portion of these Programs will be offered at 8 Market Place, Suite 600, Baltimore, MD 21202 and The Johns Hopkins Hospital. The clinical portions of these Programs will be offered at The Johns Hopkins Hospital and its affiliates.

Accreditation

Joint Review Committee on Education in Radiologic Technology
20 N. Wacker Drive, Suite 900
Chicago, IL 60606-2901
Phone (312) 704-5300

The Joint Review Committee on Educational Programs in Nuclear Medicine Technology
PMB #418
#1 2nd Avenue East, Suite C
Polson, MT 59860-107
Phone (406) 883-0003

The Joint Review Committee on Education in Diagnostic Medical Sonography
2025 Woodlane Drive
St. Paul, MN 55125
Phone (651) 731-1582

All of the programs are approved by:

The Maryland Higher Education Commission
839 Bestgate Road Suite 400
Annapolis, MD 21401
Phone (410) 260-4500

Students and prospective students may obtain information regarding the performance of each approved program from the Maryland Higher Education Commission at the above address. This information includes, but is not limited to, information regarding enrollment, completion rate, placement rate, pass rates for graduates on certify examinations in the respective disciplines.

Administration & Faculty

Jonathan S. Lewin, MD
Martin Bledsoe, MSPH, RN
Peg Cooper, MBA, RT(R)
Jay K. Rhine, BS, CNMT

Radiology Department Chairman
Radiology Department Administrator
Radiology Department Imaging Operations Administrator
Director, Schools of Medical Imaging

Faculty

Radiography Program

Jane E. Benson, MD
Sandra E. Moore, MA, RT (R)(M)
Alfred G. Traylor, BSRT (R)(CT)(MR)
Stacey A. Bickling, BA, RT(R)

Medical Director
Program Director Email : semoore@jhmi.edu
Clinical Coordinator
Clinical Coordinator

Nuclear Medicine Technology Program

Richard L. Wahl, MD
Jay K. Rhine, BS, CNMT

Medical Director
Program Director

Email : jkrhine@jhmi.edu

Diagnostic Medical Sonography Program

Ulrike Hamper, MD
Carol Iversen, MS, RDMS

Medical Director
Program Director

Email : cblank1@jhmi.edu

Student Instructor Ratios

Program in Radiography:	Lecture	32:1
	Laboratory	3:1
	Clinical	1:1
Program in Nuclear Medicine Technology:	Lecture	20:1
	Laboratory	5:1
	Clinical	1:1
Program in Diagnostic Medical Sonography:	Lecture	12:1
	Laboratory	3:1
	Clinical	1:1
Program in Computed Tomography (CT)	Lecture	10:1
	Clinical	1:1
Program in Magnetic Resonance Imaging (MRI)	Lecture	10:1
	Clinical	1:1
Program in Mammography	Lecture	10:1
	Clinical	1:1

Academic Calendar 2008-2010

2008

Classes begin (Radiography, Nuclear Medicine Technology and Diagnostic Medical Sonography)	June 9
Independence Day	July 4
Graduation - Nuclear Medicine Technology and Diagnostic Medical Sonography	August 28
Labor Day	September 1
Thanksgiving Holiday	November 27
Graduation – Radiography Class of 2008	December 12
Christmas Holiday	December 25

2009

New Years Holiday	January 1
Martin Luther King Holiday	January 19
Memorial Day	May 25
New classes begin (Radiography, Nuclear Medicine Technology and Diagnostic Medical Sonography)	June 8
Independence Day	July 3
Graduation - Nuclear Medicine Technology and Diagnostic Medical Sonography	August 27
Labor Day	September 7
Thanksgiving Holiday	November 26
Graduation – Radiography Class of 2009	December 11

2010

Classes begin (Radiography, Nuclear Medicine Technology and Diagnostic Medical Sonography)	June 14
Graduation - Nuclear Medicine Technology and Diagnostic Medical Sonography	August 26
Graduation – Radiography Class of 2010	December 17

Application & Admissions

Admission

For consideration to all of the Medical Imaging Programs, all applications and application fees must be **postmarked** by December 31st of the matriculation year. All supporting documents and transcripts must be **received** no later than January 15th of the matriculation year. Applications postmarked after December 31st will be considered only on a space-available basis. Applicants must know that these deadlines are strongly enforced, and it is the responsibility of the applicant to ensure that all materials are received by the deadlines as stated above.

Complete applications include:

- an application fee of \$25
- a completed application
- a letter of intent
- two references one from a current employer and a one from a professor of science or math, completed on program forms (see Application for details)
- transcripts documenting all post high school education
- shadow day form required for Radiography Program, strongly recommended for Nuclear Medicine Technology and Diagnostic Medical Sonography Programs

Applicants with foreign academic degrees are required to take both the Test of English as a Foreign Language (TOEFL) and the Test of Spoken English (TSE) examination(s) within one (1) year of the application deadline. Foreign transcripts must be evaluated by one of the agencies in the United States that performs academic evaluations and must document completion of all prerequisite coursework at the United States college or university level.

All applicants meeting the qualifications specified by that program will be notified and will be required to participate in a personal interview. The purpose of the interview is to assess the applicant's communication skills and maturity, and to

answer questions the applicant may have concerning the profession, the Program, or the Institution. In addition, at the time of the interview, a basic computer skills assessment will be administered.

This will consist of an assessment of the applicant's ability to type a short Microsoft Word document and to navigate the Internet. These will be timed exercises that will evaluate the applicant's computer and keyboarding skills and will be used as part of the Selection Criteria.

Acceptance decisions are primarily dependent upon the following factors:

1. Overall educational attainment with completion of required prerequisites and selected GPA from the required prerequisite coursework
2. Computer skills assessment
3. Interview process
4. TOEFL iBT scores if applicable

In cases where candidates are equally qualified the respective Program Admissions Committee will make the final selection.

Transfer Credit Policy

Transfer credits may be accepted on a course-by-course basis. Applicants wishing to have previous training considered for advanced standing in a Program must submit course descriptions and transcripts for all courses they would like to transfer. Decisions are made by the program director. A grade of B or a minimum score of 84% is required. Credit is not given for previous clinical training.

Physical Health, Background Checks and Technical Capabilities

Before the beginning of classes, all students receive a routine physical examination free of charge. Drug testing is performed as part of the pre-enrollment screening. The Johns Hopkins Hospital is a drug free environment and students will not be enrolled if they fail the drug screening.

Consistent with The Johns Hopkins Hospital policy of requiring a criminal background check for all new employees, this requirement will now be extended to all students accepted to the Schools of Medical Imaging. The background check will be initiated by the Hospital and will be conducted by PreCheck, Inc. at a cost of \$48.50 per student. This fee will become the responsibility of the student. An acceptable credentialing and background investigation must be received prior to the student beginning their Program.

All students must also meet general physical requirements for the respective disciplines. These requirements include, at a minimum, the ability to manipulate the various controls on the equipment, the strength to physically assist patients to and from the examination tables, visual acuity adequate to assess image quality on both film and computer displays, and hearing acuity adequate to detect audible patient monitoring devices and to hear instruction and requests made in a normal voice. Students must also possess the emotional stability and maturity to effectively cope in a highly stressful and sometimes emotionally charged medical environment.

Specific minimum physical requirements of all imaging disciplines include sitting, standing and walking. Both standing and sitting are associated with patient examination performance. Sitting is done at a desk while completing necessary paperwork, using a computer, or in routine office interaction. Walking within the Department is constant. Frequent pushing of portable equipment is required. Bending, stooping and reaching are required as part of the daily equipment operation. Twisting, lifting, pulling and carrying are a part of daily routine in patient transport onto exam tables and to other Divisions. The individual must be able to perform both simple and firm, grasping, and use hands for positioning of patient and equipment. Fine motor skills are required for the use of computers. Hearing must be sufficient to interpret audible flow signals of various blood vessels. The individual must be able to distinguish shades of gray and hues of color from red to blue. The individual must be able to use a telephone, as frequent communication within the Department and Medical Campus is essential. If applicant is unable to fulfill the criteria listed above due to a disability, please contact the Program Director to discuss reasonable accommodations.

International Applicants

Applicants with foreign academic degrees are required to take the TOEFL iBT examination within one (1) year prior to the application deadline. The minimum passing score on the Speaking portion of the Internet-based examination is 26 with an overall TOEFL iBT score of 80. These requirements apply, as well, to students whose courses may have been taught in English (in India, Pakistan, the Philippines, Hong Kong, Nigeria, etc.), but whose native language is not English. Original test results are required for all examinations. Copies of test results are unacceptable.

The Admissions Committee for each Program will further evaluate the applicant's communication skills and understanding of the English language at the time of their interview.

International applicants must send required documents such as, transcripts, certificates, or other academic degrees, when they send their application. Foreign transcripts must be evaluated by one of the agencies in the United States that performs academic credential evaluations and must document completion of all prerequisite coursework at the United States college or university level. If accepted into the program, students may obtain an I-20 form through the International Students Affairs Office. That office can be reached at 410-955-3371.

Tuition & Financial Aid

Tuition

Total tuition fees for the various imaging Programs are as follows:

Radiography	\$5,200*
Nuclear Medicine Technology	\$7,500*
Diagnostic Medical Sonography	\$9,000*
Computed Tomography (CT)	\$2,400*
Magnetic Resonance Imaging (MRI)	\$2,400*
Mammography	\$1,000*

Tuition schedule for each course is outlined in the appropriate section.

* The listed fees are subject to change. Please call program to confirm current cost.

Financial Aid

The School 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. Students may also apply for a low interest loan through The Johns Hopkins Federal Credit Union (JHFCU). The applicant must meet JHFCU loan requirements. The Schools of Medical Imaging do not guarantee loan approval by JHFCU. Specifics about loan policies can be addressed at the time of the applicant's interview or through the school office. All financial arrangements must be resolved before attending the respective program.

VA Approved Programs

The School is approved by the Maryland State Approving Agency to offer training to veterans and other eligible dependents under the VA educational benefit programs. The Radiography, Nuclear Medicine Technology, and Diagnostic Medical Sonography Programs are approved Programs.

The amounts charged a recipient of VA education benefits 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 School may retain \$10.00 for administrative costs.

The School will notify the VA of any change in the enrollment status of students certified to receive veteran's education benefits. This would include when the student is placed on attendance and/or academic probation, changes schedules, or terminates training.

Payment of Tuition

It is the responsibility of the student to have tuition payments in the school office by the date due. Students whose tuition is in arrears will not be allowed to participate in the Program until the tuition is paid. The office does not send out an invoice for tuition.

Students receiving scholarships can defer that part of their tuition that will be covered by the scholarships. The remaining amount of the tuition must be paid by the due date detailed for the particular course of study.

Students planning to obtain a loan through The Johns Hopkins Federal Credit Union must submit a minimum payment of \$500.00 to the School by the due date. That payment must be accompanied by a letter stating that they will be applying for a loan to cover the balance of their tuition through the Credit Union. If approved by the Credit Union, students are able to borrow money to cover their tuition only. This does not include cost of living or room and board. More details about this process will be made available during orientation week.

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 the student chooses not to enroll after the 7-day cancellation period but before the first day of instruction, the School may retain the application fee. If, after the 7-day cancellation period expires, a student withdraws after instruction begins, refunds shall be based on the total contract price for the course or program and shall include all fees EXCEPT the application or enrollment fee and any charges for materials, supplies, or books which have been purchased from the hospital by, and are the property of, the student.

Percentages of refunds are based on the proportion of the Total Course or Program taught by the 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. The date of withdrawal or termination is the last date of attendance by the student. If in the case of an official leave of absence, a student fails to return to training by the end of the leave of absence, a refund due 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.

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.

Resources and Services

There are a number of resources available to the students of the medical imaging programs. Students will be able to utilize them for case studies or technical papers that they will present during their course of study. They include:

- Combined medical imaging facilities of over 120 imaging suites or portable imaging devices
- The Johns Hopkins Hospital Department of Radiology Library
- The Johns Hopkins University, School of Medicine Welch Medical Library
- Research facilities of the Johns Hopkins University School of Medicine, Department of Radiologic Sciences
- The Johns Hopkins University, School of Medicine Computer Center
- Anatomical models and phantoms.

Housing

Accommodations are available for students who wish to live on the medical center campus. The Lowell J. Reed Hall residence has single rooms, suites, and has complete facilities for study and laundry. Charges vary according to the type of accommodation requested. For updated fees you may call the residence hall at 410-955-3905. Meals may be purchased at the Hospital cafeteria. Information for off campus housing is also available through the housing office and on the website: <http://www.hopkinsmedicine.org/housing>

Parking

Students will have satellite parking available to them during the course of the program while on rotation at The Johns Hopkins Hospital. There are 2 satellite lots with shuttle service back and forth to the hospital. The monthly cost for parking is \$65.00/month plus a \$20.00 deposit. Daily costs are approximately \$6.00 a day depending on which lot the student parks in. Free parking is available at other clinical sites. Students may access the Security office website for further information <http://www.hopkinsmedicine.org/security/parking>

Maryland Transit Authority (MTA) Metro Fees

Students are provided with a monthly Metro pass in order to attend classes and meetings that are held off campus at the Schools of Medical Imaging. This pass enables access to bus, light rail and subway services in the city of Baltimore.

Health Services

The University Health Clinic provides medical services for students enrolled in the student health plan. Students not enrolled may also be eligible for care provided they have adequate comprehensive health insurance.

Before the beginning of classes, all students receive a routine physical and screening for immunity to childhood diseases, TB, and Hepatitis A & B. Hepatitis B and yearly influenza vaccines are offered free of charge to all students.

Health insurance is required of all students at The Johns Hopkins Hospital. Students may elect to enroll in the Student Health Plan (SHP) or be covered as a dependent on a family members policy. The current SHP rate is \$182.00 per month. This rate is subject to change. Additional information concerning SHP will be available upon matriculation.

Baccalaureate Degree Options

The Johns Hopkins Hospital, through the Schools of Medical Imaging, has entered into affiliation agreements with two regional, four-year colleges. Students enrolled at these institutions may now obtain Bachelors of Science degrees in the Radiologic Sciences through this affiliation.

College of Notre Dame of Maryland, Baltimore, Maryland

The College of Notre Dame (CND), through the Weekend College, offers a program leading to a degree in Radiologic Sciences. This program is designed to accommodate part-time, weekend and full-time day students who are seeking a BS degree and certification in one or two medical imaging specialties. Students complete their prerequisite coursework at CND and then fulfill their degree requirements by completing two imaging specialties at The Johns Hopkins Hospital. Students may also choose to study only one imaging specialty at Johns Hopkins supplemented by a concentration in business administration at CND.

Approved core imaging disciplines include:

- Radiography
- Nuclear Medicine Technology
- Diagnostic Medical Sonography

Advanced Imaging Programs

- Computed Tomography (CT) - (Radiography or Nuclear Medicine required)
- Magnetic Resonance Imaging (MRI) - (Radiography, Nuclear Medicine or Diagnostic Medical Sonography required)

Interested applicants should call the Academic Advisor, College of Notre Dame of Maryland, Weekend College at (410) 532-5500 for more information.

Bloomsburg University, Bloomsburg, Pennsylvania

Bloomsburg University, located in central Pennsylvania approximately 60 miles north of Harrisburg, offers a BS degree option in Medical Imaging through a special affiliation with The Johns Hopkins Hospital. This program is designed as a full-time program for students interested in pursuing a career in medical imaging and wishing to obtain their general education and prerequisite coursework at Bloomsburg. The typical student completes two years of coursework on campus at Bloomsburg, and then fulfills his or her degree requirements by completing two imaging specialties at The Johns Hopkins Hospital. Students may also choose to study only one imaging specialty at Johns Hopkins and supplement that specialty training with an additional concentration at Bloomsburg in either business or education.

Approved core imaging disciplines include:

- Radiography
- Nuclear Medicine Technology
- Diagnostic Medical Sonography

Advanced Imaging Programs (Prior completion of either Radiography or Nuclear Medicine Technology Program is required)

- Computed Tomography (CT) - (Radiography or Nuclear Medicine required)
- Magnetic Resonance Imaging (MRI) - (Radiography, Nuclear Medicine or Diagnostic Medical Sonography required)

Interested applicants should contact Judith Kipe-Nolt, PhD, Allied Health Program Advisor at Bloomsburg University at (570) 389-4130.

Program in Radiography

General Description

The Johns Hopkins Hospital Schools of Medical Imaging offers an 18-month (79 weeks) full time program of instruction leading to certification and licensure in the field of diagnostic radiography. Nowhere is this technical sophistication more evident than in the equipment and techniques utilized in radiographic imaging. This program prepares students with a strong background in math and science for rewarding careers as medical radiographers. The students obtain, firsthand, clinical experience in radiologic procedures practiced at few other medical facilities. To facilitate the most comprehensive clinical education possible, students receive clinical training at The Johns Hopkins Hospital, Johns Hopkins Outpatient Center, Sinai Hospital of Baltimore, Northwest Hospital, Upper Chesapeake Health, American Radiology Services at Timonium Crossing, Annapolis, and White Marsh, and Johns Hopkins Bayview Medical Center.

Curriculum Outline	Lecture Hours	Lab Hours	Clinical Hours
RAD 101: Orientation & Introduction to Radiography	90		18
RAD 102: Radiographic Procedures I	58	24	
RAD 103: Medical Ethics and Law for the Imaging Professional	24		
RAD 104: Equipment Operation and Maintenance I	30		
RAD 105: Image Production and Evaluation I	28		
RAD 106: Patient Care and Pharmacology	30	24	
RAD 107: Osteology	30		
RAD 108 Medical Terminology	30		
RAD 110: Clinical Practicum I			774
RAD 202: Radiographic Procedures II	22	12	
RAD 203: Radiation Biology & Radiation Protection	32		
RAD 204: Equipment Operation and Maintenance II	38		
RAD 205: Image Production and Evaluation II	30		
RAD 206: Venipuncture Training	10	8	
RAD 220: Clinical Practicum II			888
RAD 302: Advanced Imaging Technology	20		
RAD 303: Introduction to Radiographic Pathology	24		
RAD 305: Image Production and Evaluation III	24		
RAD 306: Comprehensive Registry Review	40		
RAD 330 Clinical Practicum III			852
Total hours of instruction	3,160 hours		

Admission Requirements

Successful applicants must present a strong academic background - especially in the sciences. In addition, he or she must demonstrate responsibility, a character of high moral integrity, good interpersonal skills and compassion. All students accepted into the program must have reached the age of 18 by matriculation.

Applicants are required to have taken the following academic prerequisites, and must have completed the college course work with a grade of "C" or better in each individual prerequisite course. In addition, the combined grade point average of all prerequisite coursework must average to 2.5 or better.

- **Human Anatomy and Physiology I and II** (with laboratory)
- **College Algebra**
- **Introduction to Computers:** this course must include content in computer hardware, software, Internet and office applications.
- **The applicant must take one of the following courses:**
 - **English composition**
 - **Public Speaking**
 - **Interpersonal Communications**

The application must include the following:

- Two recommendations; one from a college science or math instructor, and one from your present employer. These must be completed on the forms provided on the website with the application. Exceptions to the above named letters may only be granted by the program director.
- Applicants must document a minimum of four hours of shadowing in a **hospital** setting. These four hours must be completed in the diagnostic (X-ray) radiology department. The students must document completion of these hours by using the Shadow Day form, attached to the application.
- A statement of intent, no longer than one page in length, stating why you chose a career in the health care profession and outlines your specific career goals in medical imaging.
- The applicant is strongly encouraged to obtain volunteer and/or employment experience in a clinical health related setting.

At the time of the interview, the candidate will be required to complete a computer competency test consisting of basic word processing skills and an Internet search for information.

Application

Applications must be **postmarked** by December 31st for those applicants wishing to enter the program the following June. All supporting documents must be **received** no later than January 15 (two weeks after the application deadline). Applications postmarked after December 31st will be considered only on a space-available basis. Applicants must know that these deadlines are strongly enforced, and it is the responsibility of the applicant to ensure that all materials are received by the deadlines as stated above.

Program Fees and Expenses

Tuition is due according to the following schedule. Complete instructions for the purchasing of textbooks and uniforms will be sent to the student prior to date of enrollment.

Tuition

June 1	\$1,300.00 *
October 1	\$1,300.00 *
February 1	\$1,300.00 *
July 1	\$1,300.00*
Books and supplies	\$600.00 *
Uniforms and accessories	\$275.00 *

* The listed fees and expenses are subject to change. Please call the program to confirm current costs.

Course Length

The Radiography Program is 18 months (79 weeks) in length. Classes begin in June and run continuously through December of the following year. Students are required to be in attendance Monday through Friday, 40 hours per week. Students will not work more than 40 hours a week, 8 hours a day. The Program allows for 12 days of personal and sick time, and all holidays designated by The Johns Hopkins Hospital.

Typical Daily Schedule

Classroom Instruction

First and Second semester classes are held two days per week, Tuesday and Friday, from 8:00 am – 4:30 pm.

Third semester classes are held on Thursdays, from 8:00 am – 4:30 pm.

Clinical Rotation Assignments: students are expected to be in clinical assignments anytime classes are not scheduled.

Clinical Practicum

Students are expected to be in clinical assignments anytime classes are not scheduled. First and second semester students will report to the assigned clinical area on Monday, Wednesday and Thursday. Third semester students will report to the assigned clinical area on Monday, Tuesday, Wednesday and Friday. Students in the first semester will have start times that will vary from 7:00 am to 10:00 am and end at 3:30 pm to 6:30 pm depending on the assignment. Second and third semester students will also have rotations assigned to the JHH ER, Sinai ER 2nd shift from 2:00 PM - 10:30 PM or JHH Park Pediatric Emergency Room from 3:00 pm – 11:30 pm.

Grading Policies

Didactic (Classroom) Grading Standards

Passing grade, “C”, for all courses is 75.
Failure of any course will result in academic dismissal.

Clinical Grading Standards

Passing grade for all clinical testing is 2.5 on a 4-point scale.

A clinical average of 2.5 is required at the end of each semester in each of the three clinical components to continue in the program.

Failure of clinical testing in any category more than twice will require remedial work in that section. Failure of testing following remedial work will result in failure of the competency testing component of the clinical program.

Grading Scale for All Courses

% Score	4.0 scale	Letter Grade
100 – 92	3.35 - 4.00	A
91 – 84	2.70 - 3.30	B
83 – 75	2.00 - 2.65	C (minimum passing grade)
74 – 60	1.00 - 1.95	D (not passing, for transcripts only)
< 60	< 1.00	F

Radiography Course Descriptions

RAD 101: Orientation and Introduction to Radiography

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. Lectures content will also include training related to cultural competencies and age-specific criteria. 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, chemical and fire safety. The student will receive training for CPR certification. The student will be expected to pass both clinical and classroom competency evaluations related to this course

RAD 102: Radiographic Procedures I

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 reviews of relevant areas of human anatomy and osteology, as well as development of critical thinking skills and evaluation of radiographs. Also included in this course is instruction in procedures that are unique to pediatrics, geriatrics, orthopedics, mobile radiography, genitor-urinary, emergency room radiography, fluoroscopy, and the operating room. This course integrates with the Clinical Competency Program. This course is divided into units with each unit having its own laboratory component. The units are chest and abdomen, extremities, pelvis, bony thorax, contrast imaging, venography, arteriography, arthrography, myelography, and hysterosalpinography.

RAD 103: Medical Ethics and Law for the Imaging Professional

This course provides the medical imaging student a basic background in ethics, medical-legal issues and ethical decision-making. The course will provide background in both historical and philosophical aspects of ethics. Problem solving skills in ethical decision making will be presented and practiced. The student will gain basic information about the legal system in relation to situations that may occur in the course of clinical practice. Emphasis will be placed throughout the course on ethical issues that will be encountered during the course of the student's professional practice.

RAD 104: Equipment Operation and Maintenance I

This course, the first in a two-semester sequence, is designed to acquaint the student with the fundamental principles of ionizing radiation. The body of the course will cover the structure of matter and elementary forces, electricity and magnetism, electromagnetism, the x-ray tube, circuitry, the x-ray unit and x-ray production.

RAD 105: Image Production and Evaluation I

This is the first course in a progressive three semester course sequence. It will provide the student with the principles of image creation in a chronological order. The student will learn about latent image production, film-screen imaging, film processing, and film artifacts. Digital imaging, including computed and direct, will be covered in depth. Processing

techniques for digital imaging will also be discussed. Information about RIS, DICOM and PACS will be covered in this course. The student will begin to critically evaluate images and propose solutions for discrepancies noted in images.

RAD 106: Patient Care and Pharmacology

This course will provide a basic understanding of skills needed to allow the student to work comfortably and safely with patients. Some of the areas covered will include basic nursing care, proper body mechanics, aseptic technique, communication, and patient monitoring to include vital signs and medical emergencies. Pharmacology and the use of radiographic contrast, including risk factors and reactions, will 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

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

RAD 108: Medical Terminology

This course will provide the student will a sound background in the language of the medical profession. The content will be based on word-building skills that begins with a study of prefixes, suffixes and root words. Specific terminology related to radiology will be discussed. Also included in the content of 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 studies 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 studies that have been presented in Radiographic Procedures I once clinical laboratory and classroom testing has been completed.

RAD 202: Radiographic Procedures II

This course will continue to provide students with detailed information on increasingly difficult radiographic examinations, to include spine imaging and headwork. 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. This course is divided into units with each unit having its own laboratory component.

RAD 203: Radiobiology and Radiation Protection

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 health care providers. The first half of the course focuses 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 focuses on means of minimizing radiation exposure. Concepts of time, distance and shielding are covered extensively.

RAD 204: Equipment Operation and Maintenance II

The second in a two-semester sequence, this course includes content areas of x-ray emission spectrum, analog and digital fluorography, specialized radiographic equipment, radioactivity, quality assurance and quality control, as well as an introduction to CT and MRI physics.

RAD 205: Image Production and Evaluation II

As the second part of a progressive three semester course, students will build upon imaging principles learned during the Image Production and Evaluation I. The student will develop a working knowledge of the theory and principles of radiographic exposure as it pertains to both film-screen and digital radiography. Detail, distortion, contrast, density, influencing and controlling factors will be emphasized. Critical thinking and problem solving skills will be enhanced while learning to manipulate exposure factors to produce optimal radiographs

RAD 206: Venipuncture

This non-graded course will be successfully completed when the student is certified in venipuncture by The Johns Hopkins Radiology Department. The student will participate in a series of classroom lecture, demonstration 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 successful completion of 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.

RAD 302: Advanced Imaging Technology

This course provides an overview of advanced imaging modalities including: Cardiovascular – Interventional Imaging, Neuro-Interventional, Computed Tomography, Nuclear Medicine Technology, Diagnostic Medical Sonography, Mammography, DEXA, and Magnetic Resonance Imaging.

RAD 303: Introduction to Radiographic Pathology

This course is designed to enable the second year radiography student to integrate information learned from courses in radiographic positioning and anatomy into 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 paper that has been independently researched by the student.

RAD 305: Image Production and Evaluation III

This course is designed for extensive group and individual participation in the critical evaluation of radiographs, typical and atypical radiographic procedures and imaging the non-conforming patient. The student is guided by the instructor in identifying problems in regard to the diagnostic quality of the radiograph. Didactic content will be presented as to critical thinking skills and the practical use of these skills in the imaging department. 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 pertinent to radiology.

RAD 306: Comprehensive Registry Review

This non-graded course is intended to prepare the student for the ARRT Registry Exam in Radiography. The five content areas correspond to those content areas of the exam. Students take practice exams throughout the course.

RAD 330: Clinical Practicum III

The final clinical practicum course will allow the student to complete all documentation and competency testing necessary for graduation from the program. Increased emphasis will be placed on the ability to critically evaluate completed radiographic studies, improved speed in performing studies and developing an increased ability to perform radiographic studies on non-conforming patients. Included in this clinical practicum will be three global, or terminal competencies

required

for

graduation.

Program in Nuclear Medicine Technology

General Description

The Nuclear Medicine Technology Program at The Johns Hopkins Hospital is a 14-month (59 week), full time program leading to certification in nuclear medicine technology. The integrated curriculum is structured to provide both theoretical training in principles of medical imaging and practical hands-on clinical experience. This program prepares students with a strong background in math, chemistry, and other science for a rewarding career as a nuclear medicine technologist.

The program takes advantage of the wide-ranging imaging resources available at The Johns Hopkins Hospital. The Division of Nuclear Medicine at The Johns Hopkins Hospital was recently recognized as one of the top diagnostic laboratories in the United States. The student is provided with unparalleled training on state-of-the-art equipment. Students gain competency in routine diagnostic examinations, SPECT and PET imaging, radiopharmacy, in-vitro procedures, and therapeutic applications. Graduates are eligible to take national certification examinations.

To facilitate the most comprehensive clinical education possible, students receive clinical training at The Johns Hopkins Hospital, John Hopkins Outpatient Center, Johns Hopkins Bayview Medical Center, Howard County General Hospital, Franklin Square Hospital Center, Saint Agnes Hospital, Sinai Hospital of Baltimore, Union Memorial Hospital, American Radiology Services (ARS), and the Nuclear Pharmacy at the University of Maryland Medical System.

Curriculum Outline	Lecture	Lab	Clinical
Summer/Fall			
NMED 201 Introduction to Medical Imaging	83	10	
NMED 202 Radiation Protection	10		
NMED 203 Introduction to NMED Procedures	18		
NMED 204 Nuclear Physics and Instrumentation	36	18	
NMED 205 Radiopharmacology	56	120	
NMED 206 Clinical Practicum I			733
Winter			
NMED 207 Radiation Biology	16		
NMED 208 Clinical Practicum II			428
Spring			
NMED 209 Non-Imaging Techniques	10		
NMED 210 Advanced Instrumentation	32		
NMED 211 Clinical Applications of Radionuclides	48		
NMED 212 Clinical Practicum III			354
Summer			
NMED 213 Clinical Practicum IV			404
Total hours of instruction	2,376		

Admission Requirements

Individuals must present a strong academic background, especially in math, chemistry and the supporting sciences. They need to demonstrate responsibility, a character of high moral integrity, good interpersonal skills and compassion. Applicants must have a minimum of a two year Associate degree with a minimum prerequisite GPA of 2.5 or be a graduate of a 2 year clinically related accredited school in Allied Health (RN, RT, RDMS, Respiratory Therapy, etc.) with appropriate certification in that clinical specialty and all prerequisite courses taken. All students accepted into the program must have reached the age of 18 by matriculation.

The following prerequisite courses are required for all applicants and must be completed with a grade of C or better. In addition, the combined grade point average of all prerequisite coursework must average to 2.5 or better.

Human Anatomy & Physiology I (with laboratory)
 Human Anatomy & Physiology II (with laboratory)
 College Algebra
 College Physics (with laboratory)
 Computer Science
 Inorganic Chemistry (with laboratory)
 Medical Terminology – This course must be taken at the college level, for credit.
 Speech and Communication

To improve your potential for selection, a one-semester course in Organic Chemistry and Statistics is highly recommended.

A documented shadow experience in a nuclear medicine facility is *highly recommended*. (If you choose to shadow, be sure to fill out the documented shadow experience form found on the website and send it with your application.)

All applicants must submit a minimum of two references on program forms (see application for these forms). Applicants with a degree must request one reference from the professor/instructor of one the prerequisite science courses and one from your current employer. The applicants that are certified in a clinical health care specialty must request a recommendation from the Program Director of your specialty-training course and a recommendation from your current employer.

Also required is a statement of intent, 200 words or less, stating why you chose a career in the health care profession and outline your specific career goals in nuclear medicine technology.

At the time of the interview, the candidate will be required to complete a computer competency test consisting of basic word processing skills and an Internet search for information.

Application

Applications must be **postmarked** by December 31st for those applicants wishing to enter the program the following June. All supporting documents must be **received** no later than January 15 (two weeks after the application deadline). Applications postmarked after December 31st will be considered only on a space-available basis. Applicants must know that these deadlines are strongly enforced, and it is the responsibility of the applicant to ensure that all materials are received by the deadlines as stated above.

Program Fees and Expenses

Tuition

June 1	\$1,875.00*
September 1	\$1,875.00*
February 1	\$1,875.00*
May 1	\$1,875.00*
Books and supplies	\$600.00*
Laboratory Coats	\$75.00*

*The listed fees and expenses are subject to change. Please call the program to confirm current costs and specific dates for tuition payment.

Course Length

Classes begin in June and run continuously through August of the following year. Students are required to be in attendance Monday through Friday. Hours will vary with clinical rotations; students will not work more than 40 hours a week or 8 hours a day. Starting hours will range from 6:30 AM to 8:00 AM. No weekends or holidays are required. The Program allows for 10 days of personal and sick time, and all holidays designated by The Johns Hopkins Hospital.

Typical Daily Schedule

Classroom Instruction

Classes are held Tuesdays and Thursdays from 8:00 a.m. until 12:00 p.m. and 1:00 pm to 4:00 pm. Certain classes are conducted off-site which will require your own transportation.

Winter/Spring classes are held Tuesdays and Thursdays from 8:00 a.m. until 12:00 p.m. and 1:00 pm to 4:00 pm.

Clinical Rotation Assignments

Students are expected to be in clinical assignments anytime classes are not scheduled.

Grading Policy

Passing grade for any didactic course is **75%** to continue in and graduate from the program. Passing grade for any clinical rotation is **84%** to continue in and graduate from the program. The grading scale for all courses in this program follows:

Grading Scale for All Courses

% Score	4.0 scale	Letter Grade
100 – 92	3.35 - 4.00	A
91 – 84	2.70 - 3.30	B
83 – 75	2.00 - 2.65	C (minimum passing grade)
74 – 60	1.00 - 1.95	D (not passing, for transcripts only)
< 60	< 1.00	F

Nuclear Medicine Technology Course Descriptions

NMED 201 Introduction to Medical Imaging

This course is an introduction to the clinical aspects of medical imaging in a hospital environment. Emphasis is on the basic orientation to the nuclear medicine division, its function, and basic patient care techniques appropriate to this function. Students will assist with routine nuclear medicine procedures in this course. This course also includes sections on:

CPR/ Orientation - 36 hours

Basic orientation consists of 2 days of mandatory hospital training. 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. In addition all students will complete the required CPR training.

Medical Ethics -16 hours

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.

Nursing and Patient Care - 19 hours

Teaches the student basic radiologic nursing and patient care procedures. It emphasizes the importance of Standard Precautions, the proper use of restraints, and the appropriate methods of handling a wide array of patient age groups.

Venipuncture -12 hours

Competency in venipuncture is accomplished initially by classroom instruction, which includes video, lectures, and practice on a training arm and fellow classmates. Practice continues using a variety of intravenous devices in a laboratory setting throughout the first semester. A final venipuncture competency evaluation will be performed at the end of the semester. Upon completion of the venipuncture competency, students will be permitted to administer radiopharmaceuticals under the direct supervision of our medical, technical and nursing staff. Radiopharmaceutical administration policies vary at affiliate sites.

Introduction to Instrumentation Laboratory - 10 hours

This portion of the course reviews basic equipment including various camera systems and hand controllers within the clinic. It also orients the student to the hospitals' patient dosing and billing systems.

NMED 202 Radiation Protection

This course prepares the student for practical encounters with sources of ionizing radiation usually found in the Nuclear Medicine laboratory. It includes the concepts of maximum permissible radiation dose and concentration of radionuclides in the environment.

NMED 203 Introduction to Nuclear Medicine Procedures

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.

NMED 204 Nuclear Physics And Instrumentation

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 205 Radiopharmacology

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

NMED 206 Clinical Practice I

Practicum that enables the student to learn under close supervision the various procedures employed in the practice of laboratory and clinical Nuclear Medicine.

NMED 207 Radiation Biology

This course prepares the student for practical encounters with sources of ionizing radiation usually found in the Nuclear Medicine laboratory. Biological effects of ionizing radiation on man are considered, with emphasis on the variables that affect the response to radiation exposure.

NMED 208 Clinical Practice II

Students learn under progressively diminishing supervision, to execute Nuclear Medicine procedures until capable of satisfactory independent performance.

NMED 209 Non-Imaging Techniques

This course includes lectures covering the principles of non-imaging techniques used in Nuclear Medicine. Non-isotopic assay procedures and dilution principles are discussed and performed.

NMED 210 Advanced Instrumentation

This course is a continuation of the instrumentation course that enables the student to learn principles of SPECT, PET, computer applications and image processing.

NMED 211 Clinical Applications of Radionuclides

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 highly developed research project and presentation.

NMED 212 Clinical Practice III

Extension of Clinical Practice II (NMED 208), providing experience for the student in various areas of laboratory and clinical Nuclear Medicine.

NMED 213 Clinical Practice IV

Extension of Clinical Practice III (NMED 212), providing experience for the student in various areas of laboratory and clinical Nuclear Medicine with the student working independently with staff observing.

Program in Diagnostic Medical Sonography

General Description

The Johns Hopkins Hospital offers a comprehensive 14 months (60 week), full time program in Diagnostic Medical Sonography. This program capitalizes on the exceptional equipment and faculty resources available at this institution and provides the students with unparalleled training on state-of-the-art diagnostic ultrasound equipment. The students obtain firsthand clinical experience in a broad range of both routine as well as highly specialized ultrasound procedures. The Division of Ultrasound at The Johns Hopkins Hospital is one of the largest and most dynamic labs in the country. Clinical training includes a thorough familiarization of routine diagnostic exams with additional foci in specific areas such as: high-risk obstetrics, abdominal, small parts imaging, gynecology, breast, pediatrics, and neurosonology. Specialties also include all aspects of spectral color, power color Doppler (peripheral, cerebral, and abdominal), endocavity imaging, intraoperative and interventional ultrasound. Graduates are eligible to take the national certification examination.

To facilitate the most comprehensive clinical education possible, students receive clinical training at The Johns Hopkins Hospital, Johns Hopkins Outpatient Center, Johns Hopkins Outpatient Center Avon Breast Center, Johns Hopkins Maternal/Fetal Diagnostic Center, Johns Hopkins Bayview Medical Center, Franklin Square Hospital Center, Good Samaritan Vascular Laboratory, Union Memorial Vascular Laboratory, and Sinai Hospital of Baltimore.

Curriculum Outline	Lecture	Lab	Clinical
Introduction to Medical Imaging including: Patient Care in Ultrasound Professional Ethics Sectional Anatomy Introduction to Physiology and Pathophysiology	228	60	144
Ultrasound Physics and Instrumentation	40		
Sonographic Anatomy, Pathology and Scanning Techniques in:			
Abdomen	98	40	300
Breast	32	28	116
Small Parts	32	16	121
Obstetrics and Gynecology	156	52	372
Vascular & Doppler Imaging	96	32	235
Pediatric	30	16	16
Interventional Ultrasound	24	8	68
Professional Presentation and Extended Clinical	16		
Total hours of instruction	2,376 hours		

Admission Requirements

Individuals must present a strong academic background, especially in the supporting sciences. They need to demonstrate responsibility, a character of high moral integrity, good interpersonal skills and compassion. Applicants must have a minimum of a two year Associate degree with a minimum GPA of 2.5 or be a graduate of a two year clinically related accredited school in Allied Health (RN, RT, RDMS, Respiratory Therapy, etc.) with appropriate certification in that clinical specialty.

The following prerequisite courses are required for all applicants and must be completed with a grade of C or better and appear as listed below on your official transcript. In addition, the combined grade point average of all prerequisite coursework must average to 2.5 or better.

Human Anatomy & Physiology I, II (with laboratory)

College Physics with a Laboratory (4 credits)

College Algebra or higher mathematics

Medical Terminology – This course must be taken at the college level, for credit.

Speech and Communications

Introduction to Computer Software Applications

A documented shadow experience in a nuclear medicine facility is *highly recommended*. (If you choose to shadow, be sure to fill out the documented shadow experience form found on the website and send it with your application.)

All applicants must submit a minimum of two references on program forms (see application for these forms). Applicants with a degree must request one reference from the professor/instructor of one the prerequisite science courses and one from your current employer. The applicants that are certified in a clinical health care specialty must request a recommendation from the Program Director of your specialty-training course and a recommendation from your current employer.

A statement of intent, 200 words or less, stating why you chose a career in the health care profession and outline your specific career goals in medical imaging is also required.

At the time of the interview, the candidate will be required to complete a computer competency test consisting of basic word processing skills and an Internet search for information.

Application

Applications must be postmarked by December 31st for those applicants wishing to enter the program the following June. All supporting documents must be received no later than January 15 (two weeks after the application deadline). Applications postmarked after December 31st will be considered only on a space-available basis. Applicants must know that these deadlines are strongly enforced, and it is the responsibility of the applicant to ensure that all materials are received by the deadlines as stated above.

Program Fees and Expenses

Tuition is due according to the schedule below. Complete instructions for the purchasing of textbooks and uniforms will be sent to the student prior to date of enrollment.

Tuition

May 15	\$2,250.00*
October 1	\$2,250.00*
February 1	\$2,250.00*
May 1	\$2,250.00*
Books and supplies	\$600.00*
Uniforms and accessories	\$200.00*

*The listed fees and expenses are subject to change. Please call the program to confirm current costs.

Course Length

Classes begin in June and run continuously through August of the following year. Students are required to be in attendance Monday through Friday. Hours will vary with clinical rotations; students will not work more than 40 hours a week or 8 hours a day. Starting hours will range from 7:00 AM to 8:00 AM. Limited weekends, evenings or holidays are required. Occasionally students are required to attend an evening or weekend conference. The Program allows for 10 days of personal and sick time, and all holidays designated by The Johns Hopkins Hospital.

Typical Weekly Schedule:

Monday, Tuesday, Friday:

Clinical 8 hours per day. Hours of attendance vary from 8-4:30 to 8:30-5

Wednesday, Thursday:

Didactic 8 hours per day. Hours of attendance vary from 7-3:30, 8-4:30, 8:30-5:00

Grading Policy

Passing grade for any didactic course is **75%** to continue in and graduate from the program. Passing grade for any clinical rotation is **84%** to continue in and graduate from the program. The grading scale for all courses in this program follows:

Grading Scale for All Courses

% Score	4.0 scale	Letter Grade
100 – 92	3.35 - 4.00	A
91 – 84	2.70 - 3.30	B
83 – 75	2.00 - 2.65	C (minimum passing grade)
74 – 60	1.00 - 1.95	D (not passing, for transcripts only)
< 60	< 1.00	F

Diagnostic Medical Sonography Course Descriptions

Introduction to Medical Imaging

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 radiological 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 radiologic procedures in all diagnostic imaging specialties.
2. An introduction to medical ethics including patient and staff rights and responsibilities, confidentiality and privacy issues, and ethical situations.
3. 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.
4. An introduction to radiologic department nursing care procedures including blood-borne pathogens training, cardiopulmonary resuscitation training, infection control, and body mechanics for safe patient transport.
5. An introduction to cross sectional anatomy of the head, thorax, abdomen and pelvis including vasculature, abdominal musculature, abdominopelvic spaces, and peritoneal reflections.
6. An introduction to pathology including neoplasms, fluid collections, abscesses, lymphatic system pathology, and aortic pathology.
7. An introduction to ultrasound physics and equipment manipulation, ultrasound procedures and protocols, and patient care techniques for ultrasound specific examinations. The student begins laboratory exercises in scanning techniques.

Abdominal Didactics

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.

Abdominal Clinical Practicum

A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound exams and procedures primarily involving structures of the abdomen and male pelvis as presented in Abdominal Ultrasound. Weekly seminars with instructional staff are also included.

Acoustical Physics and Instrumentation

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 ultrasound instruments and transducers are presented as well as the appropriate operation of principle controls of each. Quality assurance and safety issues are also discussed.

Breast Didactics

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.

Breast Clinical Practicum

A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound exams and procedures primarily involving the breast as presented in class. Weekly seminars with instructional staff are also included.

Small Parts Didactics

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.

Small Parts Clinical Practicum

A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound exams and procedures primarily involving small and/or superficial structures as presented in class. Weekly seminars with instructional staff are also included.

OB/GYN Didactics

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.

OB/GYN Clinical Practicum

A practicum that enables the student to learn and perform, under close supervision, the various routine ultrasound exams and procedures primarily involving obstetrics as presented in class. Weekly seminars with instructional staff are also included.

Vascular Didactics

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.

Vascular Clinical Practicum

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, small parts sonographic examinations under limited supervision during this time. Weekly seminars with instructional staff are also included.

Pediatric and Interventional Ultrasound Didactics

This course is an introduction to sonographic imaging in pediatric and interventional ultrasound. This includes neonatal neurosonology, 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.

Pediatric and Interventional Ultrasound Clinical Practicum

A practicum that enables the student to observe, learn and perform, under close supervision, selected pediatric procedures and to primarily observe selected interventional procedures. The student will continue to practice and perform spectral Doppler and color Doppler examinations of the abdominal, cerebral, and peripheral vascular systems. Students also continue to perform routine abdominal, OB-GYN, small parts, and breast sonographic examinations under limited supervision during this time. Weekly seminars with instructional staff are also included.

Professional Presentation/Extended Clinical Practicum

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, small parts, breast, vascular and pediatric sonographic examinations under limited supervision during this time. Weekly seminars with instructional staff are also included.

Advanced Imaging Programs

Computed Tomography (CT) Program

General Description

The Johns Hopkins Hospital offers a five-month program in Computed Tomography (CT). This program is an advanced specialty course of instruction intended for radiographers who desire specific training in Computerized Tomography. The sophistication of this technical discipline has advanced to such a point that it is no longer reasonable to expect radiographers to be able to master it through on-the-job type training. This course is also intended to prepare the student to take the advanced certification exam in this imaging modality.

Students entering training in this highly technical field will gain a thorough understanding of the physical principles upon which they are based, a knowledge of anatomy from a cross sectional perspective, and extensive clinical training in CT. The Johns Hopkins Hospital houses one of the largest cross sectional imaging departments in the country. The range of procedures performed here and at the Program's other clinical sites is exceptionally comprehensive and broad in scope.

Curriculum Outline	Lecture	Clinical
Cross Sectional Anatomy	16	
Patient Safety, Contrast Media and Venipuncture	10	
Pathology	30	
CT Principles and Instrumentation	20	
CT Procedures and Protocols	12	
CT Clinical Practicum		712
Total hours of instruction	800 hours	

Computed Tomography (CT) Program Course Descriptions

Cross Sectional Anatomy

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 and Neck, Thorax, Abdomen, and Pelvis.

Patient Safety, Contrast Media, and Venipuncture

This course, taught concurrent with the MRI program, focuses on patient care and safety issues as well as the administration of contrast media uniquely related to both CT and MRI. Topics included are: Types of contrast media; contrast reactions; patient questionnaires; informed consent; contraindications to contrast administration; and specific risks and precautions associated with both CT and MRI procedures. The student also is instructed in venipuncture techniques and will demonstrate ability to select the appropriate contrast media, calculate dose requirements, gain venous access and administer the contrast agent to the patient.

Computerized Tomography Principles and Instrumentation

This course is a thorough familiarization with the physics, image quality control factors, and equipment implementations of Computerized Tomography. Topics included are: 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 reconstructions. Current generation of CT scanning technology is described and the relative advantages of different systems are compared.

CT Procedures and Protocols

This course is a survey of routine CT imaging procedures. The content is divided into three units: Head, neck and spine; Chest and Abdomen; and 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.

Pathology

This course, taught concurrent with the MRI program, is a survey of common pathologies that are frequently imaged using cross sectional technology. The student will become familiar with the typical appearance of each pathology in the relevant imaging technologies utilizing a cross sectional perspective and how their appearance contrasts with normal anatomy. Emphasis will be placed on the relative strengths and weaknesses of each modality from a diagnostic and clinical perspective as well as special considerations or challenges each pathological condition represents. This course is not intended as a preparation for interpretation of images but rather for accurate assessment of the relevance of requested exams and key features to be identified.

CT Clinical Practica

This is the clinical component of the training in CT. Students gain hands on experience with different types of 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.

Magnetic Resonance Imaging (MRI) Program

General Description

The Johns Hopkins Hospital offers a six-month program in Magnetic Resonance Imaging (MRI). This program is an advanced specialty course of instruction intended for medical imaging technologists who desire specific training in Magnetic Resonance Imaging. The sophistication of this technical discipline has advanced to such a point that it is no longer reasonable to expect medical imaging technologists to be able to master them through on-the-job type training. This course is also intended to prepare the student to take the advanced certification exams in this imaging modality.

Students entering training in this highly technical field will gain a thorough understanding of the physical principles upon which it is based, a knowledge of anatomy from a cross sectional perspective, and extensive clinical training in MRI. The Johns Hopkins Hospital houses one of the largest cross sectional imaging departments in the country. The range of procedures performed here and at the program's other clinical sites is exceptionally comprehensive and broad in scope.

Curriculum Outline	Lecture	Clinical
Cross Sectional Anatomy	16	
Patient Safety, Contrast Media and Venipuncture	10	
MRI Principles and Instrumentation	30	
MRI Procedures and Protocols	18	
Pathology	30	
MRI Clinical Practicum		856
Total hours of instruction	960 hours	

Magnetic Resonance Imaging (MRI) Program Course Descriptions

Cross Sectional Anatomy

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 produce 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 and Neck, Thorax, Abdomen, and Pelvis.

Patient Safety, Contrast Media, and Venipuncture

This course focuses on patient care and safety issues as well as the administration of contrast media that is uniquely related to both CT and MRI. Topics included are: Types of contrast media; contrast reactions; patient questionnaires; informed consent; contraindication to contrast administration; and specific risks and precautions associated with both CT and MRI procedures. The student also is instructed in venipuncture techniques and will demonstrate ability to select the appropriate contrast media, calculate dose requirements, gain venous access and administer the contrast agent to the patient.

Magnetic Resonance Physical Principles and Instrumentation

This course is intended as a discussion of MRI physics, imaging parameters, and imaging equipment. Students will be introduced to the basic mechanism of MRI imaging, the equipment implementations of that technology and the host of factors that influence image quality. Also included is a description of pulse sequences typically utilized in MRI techniques, the applications, strengths and weaknesses, and equipment considerations for each technique.

Beyond the basics, the student will become familiar with techniques of fast imaging, MR angiography, MR spectroscopy, phase contrast imaging, and functional diffusion imaging.

MRI Procedures and Protocols

This course is a survey of MR Imaging procedures, important anatomy to be visualized, and typical protocols utilized to image these structures. The content is divided into four categories: Brain and Spinal cord, Neck and Thorax, Abdomen and Pelvis, and Musculo-skeletal procedures. Also included is a discussion of vascular imaging procedures of the head, neck, and extremities. The student also is familiarized with image enhancement and artifact control issues for each region or procedure.

Pathology

This course is a survey of common pathologies that are frequently imaged using cross sectional technology. The student will become familiar with the typical appearance of each pathology in the relevant imaging technologies utilizing a cross sectional perspective and how their appearance contrasts with normal anatomy. Emphasis will be placed on the relative strengths and weaknesses of each modality from a diagnostic and clinical perspective as well as special considerations or challenges each pathological condition represents. This course is not intended as a preparation for interpretation of images but rather for accurate assessment of the relevance of requested exams and key features to be identified.

MRI Clinical Practica

This is the clinical component of the training in MRI. Students gain hands on experience with different types of imaging equipment and procedures typically performed on that equipment. Students are expected to master the techniques for each category of procedures in MRI and will be required to demonstrate competency for a limited range of routine procedures.

Mammography Program

General Description

The Johns Hopkins Hospital offers a 10-week program in mammography. This program is an advanced imaging specialty course of instruction intended for radiographers who desire specific training in mammography. The curriculum is based on the recommendations from the American Society of Radiologic Technologists. The course lecture content when combined with the clinical components of the course will cover all necessary requirements for the MQSA. The program is a full time course of study, and will enable the student to gain all clinical competencies required to complete the American Registry of Radiologic Technologists requirements to sit for the certification boards for mammography. In addition to mammography training, the student enrolled in this program will receive classroom instruction and clinical training in bone densitometry. The students will rotate through clinical sites at The Johns Hopkins Hospital and Johns Hopkins at Greenspring Station, an outpatient facility located in Lutherville, MD.

Lecture content will consist of the following:

- History of Mammography
- Risk Factors and Prevention Programs
- Clinical Breast Examination
- Breast Anatomy and Physiology
- Positioning
- Equipment Specifications
- Digital Imaging
- Technical Applications
- Breast Pathology
- Compression
- Screen and Film Imaging
- Implant Positioning
- Taking a Clinical History
- Patient Care Considerations
- The Non-Conforming Patient
- Quality Assurance and Quality Control
- Interventional Procedures
- The Role of Nuclear Medicine and MRI in Breast Imaging
- Bone Densitometry
- Regulations

Advanced Imaging Programs in CT, MRI and Mammography General Information

Computed Tomography (CT)

Bea Mudge, RT (R)(CT) Program Director

Magnetic Resonance Imaging (MRI)

Scott Pryde RT (R)(MR) Program Director

Mammography

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

Admissions Requirements

Applicants must be graduates of an accredited Radiography program for CT and Mammography. Graduates of a Nuclear Medicine Technology Program may also apply to the CT Program. Graduates of an accredited medical imaging program (Radiography, Nuclear Medicine Technology or Diagnostic Medical Sonography) may apply to the MRI Program. The applicant must be certified in their respective discipline. In addition, he or she must demonstrate responsibility, a character of high moral integrity, good interpersonal skills and compassion. Applicants are required to complete their college or hospital course work with a **minimum GPA of 2.5 or 85%**.

Applicants must submit a minimum of two letters of reference. One must come from your Program Director and the other from either your present employer or an instructor. Transcripts are also required along with a copy of your current registry card.

A statement of intent, 200 words or less, stating your specific career goals as a medical imaging specialist is also required.

Priority acceptance is extended to those applicants who agree to remain on the JHH Radiology Staff for a period of 18 months. Tuition may be waived for those individuals.

Application

College or Program transcripts, letters of reference, a photocopy of your registry card, and the statement of intent should accompany your application. **Application and supporting documents must be received on or before August 1st to be considered for the January class of the following year. Applications received after that date will be considered on a space available basis.**

Program Fees and Expenses

Tuition is due on or before January 1 of the year of enrollment. Complete instructions for the purchasing of textbooks and uniforms will be sent to the student prior to date of enrollment. Students are also required to maintain personal health insurance coverage throughout the duration of the program.

CT and MRI Tuition	\$2,400.00*
Books and supplies (CT & MRI)	\$350.00*
Mammography Tuition	\$1,000.00*
Books and supplies (Mammography)	\$100.00*

* The listed fees and expenses are subject to change. Please call the program to confirm current costs.

Course Length

Classes begin in January and run continuously through May for the CT Program and through June for the MRI Program. Classes begin in January and run for 10 consecutive weeks for the Mammography Program. Students are required to be in attendance Monday through Friday from 8:00 AM to 4:30 PM except for Hospital holidays and designated program vacations.

Grading Policy

Passing grade for any didactic course is **75%** to continue in and graduate from the program. Passing grade for any clinical rotation is **84%** to continue in and graduate from the program. The grading scale for all courses in this program follows:

Grading Scale for All Courses

% Score	4.0 scale	Letter Grade
100 – 92	3.35 - 4.00	A
91 – 84	2.70 - 3.30	B
83 – 75	2.00 - 2.65	C (minimum passing grade)
74 – 60	1.00 - 1.95	D (not passing, for transcripts only)
< 60	< 1.00	F

Administrative Policies

Attendance Policy

The general policy of the School regarding attendance is that, aside from scheduled holidays or vacations, students are expected to be in class or in their scheduled clinical assignment. The students will be awarded a bank of hours to use for personal and sick time. This consists of 12 days of personal and sick time for the Radiography Program and 10 days of personal and sick time for the Nuclear Medicine Technology and the Diagnostic Medical Sonography Programs. If a student uses more hours than are available in their bank of hours, the student may make up to 40 hours of missed time before graduation. Any time missed beyond their bank of hours and the additional 40 hours must be made up after graduation.

Absences on class days are handled at the discretion of the individual course instructors. Missed material must be made up, but the students are not guaranteed the opportunity to take exams or quizzes unless they have made prior arrangements with the relevant instructor.

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. In the event that classes are cancelled, the student is expected to report to their clinical assignment, or use time from their bank of hours.

Leave of Absence Policy

A Leave of Absence (LOA) may be granted due to illness or serious established need. The maximum LOA within the entire length of the Program may not exceed 60 days. The student must submit a written request for consideration of approval of a leave of absence to the Program Director. Final approval of the request rests with the Program 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 respective Program and before the student is eligible take the national certification examinations.

Academic and Clinical Progress Requirements

Satisfactory performance in class work and clinical practice and personal suitability for a medical imaging specialist are required for continuation in the Program. Formal progress reviews with the director are held prior to the end of each semester. Passing grades (defined separately for each program) in both academic and clinical portions of the Program must be maintained to remain in the Program. In addition, poor performance in areas of professionalism relating to patient care, responsibility, attendance, etc. may also be grounds for dismissal from the Program. Three unexcused absences (no call or leaving early without authorization) will result in dismissal from the Program. Also, multiple incidences of tardiness will result in the lowering of the student's clinical grade that could result in dismissal. A record of attendance and academic achievement is maintained for each student. This record is updated at least once a semester.

A student may be placed on probation at any time during the Program. At the time the student is placed on probation, the student will be given written notice of such probation, behaviors that need to be corrected, and the time frame that such behavior corrections must be accomplished. The possibility for dismissal will be indicated at this time. This document will be discussed and signed at a meeting with the Program Director. Before being removed from probation, the student will have a meeting with the Program Director.

Cause for probation may include, but are not limited to:

- Unsatisfactory clinical or academic grades
- Infraction of major or minor disciplinary policies.
- Unexcused absence
- Other reasons as deemed appropriate by the program faculty.

A student will remain on academic probation for the duration of a given semester. Depending upon the circumstances, a student will remain on clinical probation for a minimum of the end of a given semester to a maximum of the duration of the Program. A student is removed from clinical probation at the discretion of the Program Director.

A student may be dismissed from the Program at any time. 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. Dismissal is permanent, and does not allow for reapplication to the program. Instances involving patient safety, academic integrity, ethical issues, or radiation safety, 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 Director.

Requirements for Graduation

To graduate, students must demonstrate satisfactory progress in class work and clinical skill development as defined by the respective Program. Students must also demonstrate personal suitability for the profession, which includes meeting attendance requirements to continue in the Program in good standing.

Tuition for each semester must be paid in full prior to the due date listed in the calendar. A student whose financial obligations are in arrears will not be allowed to participate in the Program until the debt is resolved. All outstanding debts to the Hospital and/or University must be paid before students are considered eligible for graduation.

Students who successfully complete all core Program requirements will be awarded a certificate and a pin in their specific discipline from The Johns Hopkins Hospital.

Grievances and Due Process

All students have the right to appeal administrative decisions made by faculty and staff of the Schools of Medical Imaging. Every attempt should be made to rectify the perceived grievance by a meeting among interested parties. If the perceived grievance is not rectified through a meeting, the formal process of appeal, as detailed in the Student Handbook, includes four levels:

- 1) a written statement is delivered to the Program Director for review;
- 2) an appeal, in writing, to the Director, Schools of Medical Imaging;
- 3) a final appeal, in writing, to designated representatives of the Institution outside of the Radiology Department for resolution. These persons are appointed by the respective Program's Advisory Committee to arbitrate such matters;
- 4) The student also has the right to appeal to the Secretary of Higher Education at the Maryland Higher Education Commission.

Right to Change Rules or Program Changes

The Schools of Medical Imaging reserve the right to change administrative policies and other regulations as necessary.

Drugs & Alcohol Policy

The Johns Hopkins Hospital is a drug and alcohol free environment and students will be dismissed who are found to be in violation of this Hospital policy.

Disclosure Statement for State Licensure

Students in training programs for occupations requiring state licensing must note that criminal convictions may affect a student's ability to be licensed.

Release of Student Information Policy

The Family Educational Rights and Privacy Act of 1974 apply to policies governing access to and release of student education records maintained by educational institutions that are recipients of federal funds. The Johns Hopkins Hospital Schools of Medical Imaging complies with this statute, which states in part:

1. Afford students access to education records directly related to them;
2. Offer students an opportunity for a hearing to challenge such records as inaccurate, misleading, or otherwise inappropriate;
3. Receive students' written consent before releasing information from their education records to persons outside the hospital, except for directory information as indicated below (information may be furnished to a student's parents without such written consent only upon certification of the student's financial dependency);
4. Comply with a judicial order or lawfully issued subpoena to release a student's record, notifying the student of this action.

Student Transcripts

Student transcripts are a permanent record of the School. The authorization to release a student's transcript must be made in writing. No telephone or faxed requests will be honored. There is an \$8.00 fee for transcripts, and requests should be made about a week in advance of when they will be needed. Transcripts will not be released if financial obligations have not been met.