Student Information Handbook

Indiana University of Pennsylvania

Department of Allied Health Professions

Bachelor of Science in
MEDICAL IMAGING

Tracks:

Nuclear Medicine Technology
Diagnostic Medical Sonography
Echocardiography

April 2024

Also available at http://www.iup.edu/rn-alliedhealth

Medical Imaging Information

Mission

The mission of the Department of Allied Health Professions is to define, provide, and advance the education and development of professionals within the field of allied health. The mission of medical imaging is to provide undergraduate and graduate education for students whose academic and professional goals are directed toward a career in medical imaging. The program challenges students to develop their abilities to provide care for culturally diverse populations with changing health needs. Undergraduate students have a liberal education, are clinically competent, and are prepared to function at a beginning level of professional practice. The medical imaging faculty supports the expansion of medical imaging through scholarly work and fosters a commitment to lifelong learning and community service.

History

Indiana University of Pennsylvania first offered the Bachelor of Science degree program in medical technology in 1968. In 1973 the respiratory care program, then known as respiratory technology, graduated its first class. Allied Health was a separate department in the university until 1989 when it merged with Nursing to become the Department of Nursing and Allied Health Professions. Nuclear medicine technology was added to the department in 1994 and the latest change to the Allied Health Program will be the bachelor's degree in Medical Imaging with the option of 3 tracks – Nuclear Medicine Technology, Diagnostic Medical Sonography or Echocardiography. The name of the medical technology program was changed to clinical laboratory science in 2003 and back to medical technology in 2019. The most recent change, approved in 2003, was the addition of a special curriculum track for respiratory therapists who are already certified and interested in completing a Bachelor of Science degree. There have been 599 Medical Technology/Clinical Laboratory Science graduates, 276 Nuclear Medicine Technology graduates, 842 Respiratory Care graduates, and 2 graduates from the Respiratory Care CRT track.

Coordinator

The allied health programs are coordinated by a faculty member in the Department of Allied Health Professions. The coordinator serves as the academic advisor for all students in the Medical Imaging and Medical Technology programs.

Communication and Contacts

All allied health students are expected to use their IUP email address. Important and helpful information is sent to students from the coordinator, secretary, registrar, and other campus offices. Assistance with the use of the IUP email system is available at 724-357-4000. The IT Support Center is in Delaney Hall, Suite G35. Hours are Monday through Friday from 7:30 a.m. to 5:30 p.m. and 8:00 a.m. to 4:30 p.m. during summer sessions, breaks, and when classes are not in session. The web address is www.iup.edu/ITSupportCenter.

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Medical Imaging

The Bachelor of Science degree program in Medical Imaging is designed to prepare the graduate to have:

- Skills in problem solving, critical thinking, and decision making
- Skills in oral and written communication
- Skills in human relations and patient services
- Familiarity of applicable medical law and ethics
- A commitment to make a significant contribution to the health care team
- An appreciation and respect for cultural diversity
- A holistic caregiver's perspective
- An understanding of departmental organization and function in relation to the healthcare delivery system as a whole
- An understanding of the value and responsibilities entailed in being a professional

The program leading to the BS degree in Medical Imaging is designed to prepare students for admission into an IUP affiliate institution focused on one of three tracks: Nuclear Medicine Technology, Diagnostic Medical Sonography (Ultrasound), or Echocardiography. This program is a 3 + 1 format, wherein the student spends the first three years at IUP completing the required math, science, and liberal studies courses. Subsequently, they spend 12-15 months at an affiliate institution, where they earn a certificate in one of the specialty diagnostic imaging programs. All the coursework at IUP is preparatory towards the final year and the requirements by the Medical Imaging profession. A C or better in the following courses is required: MATH 105, CHEM 103, ENGL 101, ENGL 310, PHYS 111, BIOL 150, Biol 240, and PHIL 130.

Acceptance at an affiliate school is contingent upon the student meeting the academic program requirements. At the end of their senior year, upon successful completion of the certificate program at an articulated clinical affiliate accredited within the specific discipline, IUP will grant 32 credits that will be applied to the student's transcript and the bachelor's degree in the Medical Imaging track will be conferred.

Nuclear Medicine Technology

Nuclear medicine is the medical specialty that utilizes the nuclear properties of radioactive and stable nuclides to make diagnostic evaluations of the physiologic and/or anatomic conditions of the body and to provide therapy with unsealed radioactive sources. The Nuclear Medicine Technologist is an allied health professional who, under the direction of an authorized user, is committed to applying the art and skill of diagnostic evaluation and therapeutics through the safe and effective use of radionuclides. Responsibilities include, but are not limited to: preparation, quality control testing and administration of radioactive compounds; execution of patient imaging procedures including computer processing and image enhancement; laboratory testing; patient interviews; instruction and preparation for administration of prescribed radioactive compounds for therapy; quality control; and radiation safety. The nuclear medicine technologist exhibits professionalism in the performance of these duties, demonstrates an empathetic and instructional approach to patient care, and maintains confidentiality of information as required.

He/she applies knowledge of radiation physics and safety regulations to limit radiation exposure of the general public, patients, fellow workers, and self to as low as reasonably achievable (ALARA). Professional growth and development are achieved through appropriate utilization of technologies such as PET, cross-sectional fusion technology, and participation in medical and technical education and research to enhance the quality of patient care.

These goals and description of the profession are included in the Essentials and Guidelines for an Accredited Educational Program for the Nuclear Medicine Technologist (2021) accepted by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT) and other professional associations.

Upon successful completion of all degree requirements, graduates are eligible to sit for the national registry examinations administered by the Nuclear Medicine Technology Certification Board (NMTCB) and the American Registry of Radiologic Technologists (AART). In many states, certification by either one of these two national organizations are needed to apply for licensure, so the individual may legally work in that state.

Diagnostic Medical Sonography (Ultrasound)

Diagnostic medical sonography or ultrasound is a medical specialty in which allied health care professions use specialized equipment to create images of structures inside the human body. Working under the supervision of a physician responsible for the use and interpretation of ultrasound procedures, the sonographer helps gather sonographic data to diagnose a variety of conditions and diseases, as well as monitor fetal development.

The process involves placing a small device called a transducer against the patient's skin near the body area to be imaged. A stream of high-frequency sound waves is sent into the body, then are detected as the sound waves bounce off internal structures. Different structures in the body reflect these sound waves differently. The reflected sound waves are analyzed by a computer to make an image of the structure(s) on a monitor or that can be recorded on hard copy images. These images created by sonographers help aid physicians in diagnosing and treating medical conditions in the abdomen, breast, heart and blood vessels and, more recently, in diagnosing and treating musculoskeletal problems.

Echocardiography

Echocardiography is a medical specialty in which allied health care professionals use specialized equipment to create images of structures inside the human body. These professionals use echocardiogram technology to produce images of the patient's hearts. They create 2-D and 3-D pictures of the heart through the use of high frequency sound waves and special equipment. A transducer is placed against the patient’s skin by sending a stream of high frequency sound waves into the body and then detects the sound waves as they bounce off the heart. The reflected sound waves are analyzed by a computer to make an image of the structure(s) on a monitor or that can be recorded on hard copy images. The images created by sonographers help aid physicians in diagnosing and treating numerous disease processes. Sonographers are trusted members of the healthcare team and are relied upon to obtain diagnostic images that will allow physicians to provide the best possible care for their patients. Echocardiography technicians may specialize in adult echocardiography, pediatric echocardiography or fetal echocardiography.

Some responsibilities of Diagnostic Medical Sonographers and Echocardiographers include the following:

- Preparing and explaining the procedure to patients.
- Maintaining and operating sonography equipment to obtain optimal images.
- Analyzing and correlating the lab results and other imaging studies performed.
- Recognizing normal anatomy, anatomical variants, and pathological conditions found during the exam.
- Writing impressions of the findings of the exam for physicians.
- Managing the facility's electronic health records system.
- Providing direct patient care.

Students are admitted to the Medical Imaging major as freshmen into any of the three tracks. Transfer students and those with a previous degree may also be admitted into one of the tracks. Students must meet specific academic requirements to be considered for admission to the affiliate Medical Imaging track. Admission is competitive; IUP cannot guarantee admission. Information regarding academic requirements and other special requirements for the clinical year is available in the department's office.

The Nuclear Medicine program is fully accredited by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology. Diagnostic Medical Sonography and Echocardiography Programs are accredited by the Commission on Accreditation of Allied Health Education Programs upon recommendation of the Joint Review Committee on Education in Diagnostic Medical Sonography (JRC-DMS).

Advising Information

The Allied Health Coordinator is the *academic advisor* for all medical imaging students.

Registration for the winter sessions and spring semester begins in mid-October. Registration for fall semester and summer sessions begins in mid-March. Schedules are available through MyIUP and are typically posted several weeks before the registration period begins.

Medical imaging students receive an *early registration time* each semester and are encouraged to take advantage of this opportunity to get the best schedule possible. Students *must schedule an appointment* to meet with the allied health coordinator each semester to discuss academic progress and plans for the next semesters. At that meeting students will receive their Alternate Personal Identification Number (PIN) needed to access the registration system. Sign up times for advising appointments are posted in early-February and early-September and advisees are *notified by email* when advising appointments begin.

While students are *in their clinical year*, advising information is typically shared by email and regular mail.

Summer Course Work

Many students find it helpful to complete one or more courses during the summer months. IUP offers several courses during the summer that are included in the requirements for medical imaging majors. The summer schedule is typically available for view in early October at MyIUP.

Students may also plan to take courses during the summer at other colleges or universities. This is an excellent strategy that allows students to take a lighter course load during the academic year, pursue a special area of interest, or stay on track for the clinical year. Students interested in registering for courses at other colleges or universities should follow the steps listed below:

a. Meet with the allied health coordinator to discuss options
b. Use the Online Credit Evaluation System (www.iup.edu/admissions/) to check course equivalency
c. Contact the other college or university for details about schedules, registration, tuition,

etc.

d. Submit an online Application for Pre-Approval of Coursework At Another College or University (form is available at http://www.iup.edu/registrar/policies/pre-approved-coursework/)
e. Earn a C or higher grade to have credits posted to IUP transcript
f. Request an official transcript be sent to IUP Admissions Office, Credit Evaluation, 117 Sutton Hall, 1011 South Drive, IUP, Indiana, PA 15705
g. If you cannot find an equivalent course, ask the allied health coordinator about possible substitutions.
h. If you plan to complete BIOL 150 Human Anatomy and/or BIOL 240 Human Physiology at another college or university, you must be certain the courses are equivalent to the IUP courses. Many colleges and universities offer these courses as Anatomy and Physiology I and II. If so, you must complete both I and II at that college or university to have the courses posted to your IUP transcript as BIOL 150 and BIOL 240.

Consider Completing a Minor

With 20 credits of free electives built into the curriculum many medical imaging students consider a minor. A full listing of minors and certificates offered at IUP is a good place to begin the minor selection process. A minor in Safety Sciences is an excellent option that may improve job opportunities for graduates either upon entry into the career or at some point when the graduate is interested in exploring career advancement options. A complete list of minors and a curriculum plan for a minor in Safety Sciences is available at the back of the handbook.

Learning Support Services

Academic Support*:* Tips for success include

a. Get organized: Keep a detailed calendar with assignment due dates, exams, and other important dates. Block off study time and prepare for exams and assignments in advance.
b. Make academic success a priority: Do your work first and there will be plenty of time for involvement in campus, community and social activities.

Seek Help to Succeed and Excel: IUP offers outstanding academic support services that help students be successful in their classes. Meet with your professors during their office hours and take advantage of workshops, supplemental instruction, tutors, and the Writing Center.

c. Department of Developmental Studies (www.iup.edu/devstudies)
d. Writing Center (www.iup.edu/writingcenter)

Tutors are also available for chemistry, physics, and math. See the Allied Health Coordinator for details.

Learn More About Medical Imaging

Program directors at Medical Imaging programs encourage students to learn about the field.

Consider the following actions that will help you become acquainted with the profession:

a. Tour one or more medical imaging departments: Contact any hospital and inquire about a tour and/or shadow experience
b. Contact program directors of the affiliating schools of medical imaging for an appointment or to learn more about a specific program
c. Ask the allied health coordinator how to contact a student currently in the clinical year who is available to answer questions and offer suggestions
d. Become familiar with your future professional organizations
    i. The Society of Nuclear Medicine (www.snm.org)
    ii. American Society of Radiologic Technologists (www.asrt.org)
    iii. Society of Diagnostic Medical Sonography (www.sdms.org)
    iv. American Institute of Ultrasound in Medicine (www.aium.org)
    v. American Society of Echocardiography (www.asecho.org)

Application Process for Admission to a Certificate Program (clinical study)

Plan to meet with the allied health coordinator during the spring semester of the sophomore year to review the application process.

The medical imaging curriculum is divided into pre-clinical and clinical study. Students typically finish the first three academic years of study on the IUP main campus. To complete the program, students enter the clinical phase of the program that is one calendar year in length.

For the Nuclear Medicine Technology track, students will apply to The University of Findlay in Findlay, Ohio, The Community College of Allegheny County in Pittsburg, PA, and Pennsylvania College of Health Sciences, Lancaster, PA.

For the Diagnostic Medical Sonography track, student will apply to The University of Findlay in Findlay, Ohio, Pennsylvania College of Health Sciences, Lancaster, PA, and Widener University, Chester, PA.

For the Echocardiography track, students will apply to The University of Findlay in Findlay, Ohio.

Upon graduation the students earn a Bachelor of Science degree in Medical Imaging-Nuclear Medicine Technology, Diagnostic Medical Sonography, or Echocardiography from Indiana University of Pennsylvania.

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Admission Requirements for the Certificate Program

Students will apply to the certificate program. There are specific admission requirements, deadlines and other special requirements which may include health screening, criminal record checks, personal interviews, and the purchase of uniforms and/or lab coats.

Admission into the program is competitive and is not guaranteed.

All pre-clinical courses required by IUP must be completed before progressing to the certificate year.

Medical Imaging Tracks

Students must complete all course requirements set forth by IUP prior to beginning the certificate year. All medical imaging tracks require "C" grades or better in the following courses:

- MATH 105 College Algebra
- ENGL 101 Composition I
- ENGL 310 Public Speaking or BCOM 321 Business Communication
- CHEM 103 Intro to Chemistry for Health Sciences
- PHYS 111 Physics I Lecture
- BIOL 150 Human Anatomy
- BIOL 240 Human Physiology
- Humanities – course could be in any of the following areas: philosophy, literature, art forms (art, music, theater or other performing arts), cultural expressions, global education, ancient literature, film studies, communication studies (this would be an additional course to the speech/oral communications course that is also required), foreign language, gender studies, humanities, history, or religion
- Social Science – course could be in any of the following areas: anthropology, archaeology, behavioral sciences, criminal justice, demography, development studies, economics, education, environmental studies, geography, gerontology, international education, international relations, law, liberal arts, library science, linguistics, political science, psychology, public administration, social sciences, social work, or sociology

For the most favorable review of the application, students are encouraged to have completed all these courses before the application deadline.

In addition, medical imaging tracks require:

- Official high school transcripts
- Current, official college transcripts
- CPR certification
- Three letters of reference
- Application fee
- Medical Terminology: The medical terminology requirement may be met in one of three ways:

- Take BIOL 200 Medical Terminology course at IUP
- Online Medical Terminology 101: For approximately $75 students may enroll in an online course available at https://www.universalclass.com/i/course/medical-terminology-101.htm. A copy of the certificate of completion must be forwarded directly to NMI.
- Medical Terminology Workbook: Purchase the following text which is available through the IUP Coop Store: Leonard, P. (2020). *Quick and easy medical terminology* (9th ed.). Philadelphia: Saunders.
- You may also purchase the kindle edition e-book online from Amazon.

a. Complete all of the chapter exercises and the self-test by recording your answers in the text.

b. Give your completed text to the Allied Health Professions Coordinator for review.

c. The work will be reviewed, satisfactory completion of the requirement will be verified with the medical imaging program director and the text will be returned to the student.

It is recommended that this requirement be submitted at least 2 months prior to starting at the University of Findlay although this may be done well in advance of the recommended deadline.

Students are encouraged to submit applications approximately one year prior to beginning the certificate program. Application deadline for a fall class is November 1 of the preceding year. The deadline for a spring class is April 1 of the preceding year.

Estimated Tuition, Fees and Financial Aid*
University of Findlay
Tuition and fees for the 2023-2024 NMI program are approximately $34,309.
Tuition and fees for the 2023-2024 Diagnostic Medical Sonography is approximately $27,884.

Pennsylvania College of Health Sciences
Tuition and fees for 2023-2024
Students pay per credit, as well as program/clinical costs. The per credit cost is currently $670 with there being 32-40 credits in the Certificate programs. The program/clinical costs for Diagnostic Medical Sonography and Nuclear Medicine Technology are $2,6800 and $21,440 respectively.

Widener University
Tuition and fee for 2023-2024 Diagnostic Medical Sonography is approximately $30,600.

South Hills School of Business & Technology
Tuition and fee for 2023-2024 Diagnostic Medical Sonography is approximately $33,004.
*Tuition and fees are determined by the above affiliates.

Students may apply for financial aid during their final year through IUP's Office of Financial Aid. Amounts of awards will vary depending on several factors, including the costs of tuition and fees required by our affiliates.

Students must comply with all requirements and deadlines established by the affiliating Medical Imaging program.

Financial Aid for University of Findlay Students

- IUP will be responsible for determining and disbursing all financial aid.
- To be considered for financial aid, students will need to complete their FAFSA by April 15th for maximum eligibility.
- Financial Aid award letters will be available at the end of June early July for upperclassmen.
- During this time is also when the bills for University of Findlay will become due.
- It is the student's responsibility to notify their schools that they will not have their financial aid available until after the second or third week of IUP classes. (**Note:** Refunds are based on IUP's class schedule).
- University of Findlay expects each student to provide them with documentation of their financial aid at IUP. This can be done by printing your IUP award letter from MYIUP and sending it to Findlay.
- If additional financial aid is needed, please contact the IUP Financial Aid Office for information on the Parent Plus loan and alternative/private loans.
- After the student receives their refund (from IUP), it is then their responsibility to pay their bill at Findlay.
- **Note:** For students starting in the spring at Findlay for the academic portion of the program, you will receive financial aid in Spring 2024 and Fall of 2024, please plan accordingly during the summer session to cover costs.

Graduation

- Medical Imaging students graduate from IUP in August of the year their clinical experience is completed. The graduation application may be completed online at MyIUP.edu. Applications for August graduates are due by April 1 of the graduation year.
- Students will be invited to participate in the University's commencement ceremony scheduled in December of their graduation year. Students have an option to attend the University's May commencement ceremony and the Department of Allied Health's commencement ceremony. Details about commencement may be found at www.iup.edu/commencement.

INDIANA UNIVERSITY OF PENNSYLVANIA
Department of Allied Health Professions

Curriculum Organization

MEDICAL IMAGING

NUCLEAR MEDICINE TECHNOLOGY, DIAGNOSTIC SONOGRAPHY, MEDICAL IMAGING ECHOCARDIOGRAPHY

FRESHMAN YEAR

*MATH 105 College Algebra	3	CHEM 255 Biochemistry for Health Sciences	3
*CHEM 103 Intro to Chem for Health Sciences	4	History 196/197/198	3
*ENGL 101 Composition I	3	PSYC 101 General Psychology	3
Fine Arts Requirement	3	Dimensions of Wellness	3
SOC 151 Principles of Sociology or		IMAG 101 Careers in Medical Imaging	1
SOC 161 Found of Soc: Grps & Org	3	Free Elective	3
	16		**16**

SOPHOMORE YEAR

COSC/IFMG 101 Micro-Based Computer Literacy	3	*#BIOL 150 Human Anatomy	4
ENGL 202 Composition II	3	*ENGL 310 Public Speaking or	
*#PHYS 111 Physics I Lecture	3	BCOM 321 Business & Interpersonal Comm	3
PHYS 121 Physics I Lab	1	PHYS 112 Physics II Lecture	3
Free Elective	3	PHYS 122 Physics II Lab	1
Free Elective	2	Free Elective	3
	15		**14**

JUNIOR YEAR

*BIOL 240 Human Physiology	4	Free Elective	3
Global and Multicultural Awareness	3	ENGL 121 Humanities Literature	3
Free Elective	3	NURS 314 Health Policy and Law	3
Free Elective	3	PHIL 130 Biomedical Ethics	3
	13	IMAG 480 Medical Imaging Seminar	2
			14

SENIOR YEAR**

Courses are taught off campus for one calendar year at the University of Findlay, Community College of Allegheny County (CCAC), Pennsylvania College of Health Sciences, Widener University, and South Hills School of Business & Technology. Students will not need to register for these courses. 32-34 credits of articulated courses in the track will be transferred from the affiliation agreement and posted to the official Indiana University of Pennsylvania transcript.

**IUP is affiliated with three accredited nuclear medicine technology programs and four accredited Diagnostic Medical Sonography programs. Students apply for admission to one of these programs for completion of the final year of study.

* The Nuclear Medicine Institute (NMI) at the University of Findlay, Ohio: In this program students spend one semester at NMI, 32 weeks in clinical training at one of NMI's approved clinical sites and return to NMI for a final examination.
* The Nuclear Medicine Technology Department at CCAC: In this program students spend 12 months in classes at the CCAC Boyce Campus and clinical training at various sites in the Pittsburgh area.
* The Sonography Programs at the University of Findlay include four semesters: two-semester-long didactic portion on the UF campus and two-semester-long clinical education at one of the University's designated clinical sites.

REQUIRED: Global and Multicultural Awareness; two writing intensive courses

*Our affiliates require a C or higher grades in these courses. *Widener University requires a B or higher grades in these courses. In addition, a C or higher grade is necessary in a Humanities and Social Science course. See reverse for details. For the most favorable review of the application, students are encouraged to have completed all of these courses before the application deadline.

Humanities course could be in any of the following areas: philosophy, literature, art forms (art, music, theater or other performing arts), cultural expressions, global education, ancient literature, film studies, communication studies (this would be an additional course to the speech/oral communications course that is also required), foreign language, gender studies, humanities, history, or religion.

Social Sciences course could be in any of the following areas: anthropology, archaeology, behavioral sciences, criminal justice, demography, development studies, economics, education, environmental studies, geography, gerontology, international education, international relations, law, liberal arts, library science, linguistics, political science, psychology, public administration, social sciences, social work, or sociology.

Indiana University of Pennsylvania offered Minors

MINORS	CREDIT REQUIREMENT
Anthropology	18
Applied Statistics	18
Art History	18
Art Studio	18
Asian Studies	18
Audiology	24-25
Biochemistry	17-20
Biology	18
Biomedical Science	18
Business Administration	21
Chemistry	19
Child and Adult Advocacy Studies	18
Child Development and Family Relations	18
Communications Media	18
Community Health	18
Computer Science	18
Criminology	18
Cyber Security	18
Dance	18
Deaf Studies	18
Economics	18
Educational Psychology	18
Educational Technology	24
Elementary and Middle-Level Mathematics	18
English	15
Entrepreneurship for the Arts	18
Environmental Health Science	18
Forensic Biosciences	19-20
French	19
Geography	18
Geology	18
German	18
History	15
Homeland Security	18
Human Resource Management	15
Information Assurance	15
International Studies	18
Journalism and Public Relations	18
Latin American Studies	18
Lesbian, Gay, Bisexual, Transgender, and Queer Studies	18
Mathematics	18

Music	18
Nutrition	18-19
Pan African Studies	18
Philosophy	18
Physics	18-20
Political Science	18
Pre-Law Interdisciplinary	21
Psychological Science	18-19
Psychology	18-19
Regional Planning	18
Religious Studies	15
Safety, Health, and Environmental Applied Sciences	18
Sociology (Applied Social Research)	18
Sociology (General Sociology)	18
Sociology of Disability Services	18
Sociology (Human Services)	18
Spanish	18
Special Education	18
Sport Management	18
Sustainability Studies	18
Theater	18
Women's and Gender Studies	18

Note: See current IUP catalog for information about requirements or contact the chair of the department in which the minor/certificate is housed.

Indiana University of Pennsylvania Offered Certificates

CERTIFICATES	CREDIT REQUIREMENT
Athletic Coaching	19 Credits
Cell and Molecular Biology	15 Credits
Certification in Driver Education	12 Credits
Communications Media: Photography and Digital Imagining	18 Credits
Popular Music Studies	19 Credits
Public History	18 Credits
Secondary School Cooperative Education Teacher/Coordinator	15 Credits
Vocational-Technical Education	30-32 Credits