



Letter of Intent

Radiologic Technician Program

AAS Degree in Radiologic Technology

Office of the Provost

and

Department of Nursing

Table of Contents

1. Purposes and goals
2. Need for the Curriculum
3. Students
4. Curriculum
 Description of New Courses
5. Faculty
6. Facilities, Laboratory Equipment, Supplies and Library Materials
7. Cost Assessment

1. Purposes and Goals

3

The goal of the A.A.S. in Radiologic Technology will be to prepare radiologic technologists who are highly competent in the knowledge, skills and professional demeanor consistent with local employer expectations and national standards as described by the current ASRT Curriculum.

A. National and local educational trends

The American Society of Radiologic Technology (ASRT) has been emphasizing the importance of a college degree for professional advancement opportunities. The ASRT is currently considering a degree requirement for all entry level technologists in Radiography, Nuclear Medicine and Radiation Therapy. Currently, a degree is either preferred or required for supervisory, education, administrative and sales positions.

The following statement appeared in the Occupational Outlook Handbook for Radiologic Technologist:

Employment for Radiologic Technologist is expected to grow faster than the average for all occupations through 2006, as the population grows and ages, increasing the demand for diagnostic imaging and therapeutic technology. For example, Radiation Therapy will continue to be used – along with or in combination with surgery or chemotherapy – to treat cancer.

Hospitals remain the principal employer of Radiologic Technologists. However, employment is expected to grow most rapidly in physician's offices, clinics and diagnostic imaging centers which can be equipped to perform routine procedures. Health facilities such as these are expected to grow very rapidly due to the shift toward outpatient care and third party reimbursement. Job attrition will also contribute to the continuing need for radiographers. Numerous job openings will result from the need to replace technologists who are aging baby boomers.

Entry-level salaries have increased and vary depending on the geographical area. For New York City and its surrounding areas, the per annum salary ranges for three areas of radiologic technology areas are:

Diagnostic Radiologic Technologist-\$39,000-\$119,000

CAT Technologist-\$29,000-\$54,000

MRI Technologist-\$38,000-68,000

B. Community Interest in the Program

At this early stage in the development of the program, we have received positive responses from three Brooklyn hospitals indicating support for the program and offering to serve as clinical sites, provide clinical faculty and serve on the Advisory Committee. Kingsborough currently has active clinical training relationships with every hospital in

Brooklyn and many others as well. Mary Perry, President of the New York Society of Radiologic Technology Educators, has been brought in to consult on the development of this program.

C. Related College Offerings

The College administration has demonstrated a significant interest in programs of this type by its recent commitment to associate degree programs for surgical technologists and physical therapist assistants. The College has a long-standing A.A.S. in Nursing which has 42 faculty members, 15 of whom are full-time. Each of these programs has its own office space, classrooms and learning laboratories. The campus also offers programs in community and mental health, therapeutic recreation and transfer options to baccalaureate health professions programs, and is developing a biotechnology program.

In its July 2006 *Report of Institutional Goals* to CUNY, Kingsborough made a commitment to target new certificate and degree programs in health occupations. Currently, Letters of Intent are being prepared for five other health professions programs. These are: Veterinary Technician, Occupational Therapy Assistant, Respiratory Therapist, EMT-Paramedic and Pharmacy Technician.

The College is pursuing the creation of a new academic department which will be responsible for the A.A.S. in Radiologic Technology as well as the five other new health-technician programs. During this initial stage between the Letter of Intent and CUNY approval to develop a full proposal, and until a new department is established, the Department of Nursing has taken responsibility for the development of the A.A.S. in Radiologic Technology.

2. Need for the Curriculum

The use of diagnostic imaging services has increased dramatically over the years yet the number of registered technologists has remained stable. As a result, technologists often work longer shifts. According to the American Society of Radiologic Technologists, the general population undergoes 130 diagnostic imaging procedures annually per 100 people. By 2020, the annual number of imaging procedures is expected to grow by 140%. The U.S. Bureau of Labor Statistics predicts that the nation will need an additional 15-20% more radiographers in the next three to four years.

Exhibit 23 of *The Health Care Workforce in New York State, 2004: Trends in the Supply and Demand for Health Worker* was culled from an analysis of a survey of sample voluntary and public hospitals throughout New York State, including New York City and Long Island. Of those surveyed, 84 % reported difficulties in recruiting and 58% reported facing a shortage in radiologic technologists.

The need for more radiologic technology programs is urgent.

Recruitment and Retention Difficulties Reported by Hospitals in New York State

	Percent of Respondents Reporting Difficulties		Shortages of Workers	Competition for Workers
	Recruitment	Retention		
Pharmacists	90%	53%	58%	55%
Radiologic Technologists	84%	38%	58%	53%
RNs	71%	38%	62%	62%
Dietitians/Nutritionists	47%	14%	37%	34%
Physician Assistants	39%	39%	13%	16%
LPNs	35%	22%	82%	39%

Moreover, the shortage of these health workers is evident locally. In a newspaper article titled, "Rad Techs are in short supply...." (Newsday, October 19,2003), the local shortage forces many radiologic technologists to work long hours and multiple shifts. All of the aforementioned factors support the development of this program.

Although there is a growing need for advanced technology (such as Magnetic Resonance Imaging), the demand for less expensive diagnostic procedures will also increase. Insurance companies are trying to reduce or at least contain healthcare costs and physicians are compelled whenever possible to order less expensive diagnostic tests such as X-Rays. Second, many elderly patients cannot be exposed to the more advanced technology for diagnostic purposes because of its contraindication to implanted life-saving devices. Third, according to the American Society of Radiologic Technologists, as the average age of radiologic technicians is now fifty, retirements in the next decade will come at the same time patient demand for diagnostic procedures is increasing.

3. Students

Kingsborough administration, faculty and counseling staff universally agree in the principle of "If we build it; they will come". Brooklyn has a population of over 2.2 million and, certainly, the population served by Kingsborough is large enough to expect a strong positive reaction to educational opportunities at this level for this rewarding profession. Applicant pools for the extant programs are excellent at present.

Enrollment at Kingsborough Community College (excluding College Now) reached 11,790 students in the spring 2005 semester. In spite of the interest of significant numbers of these students in allied health career education, many do not have access due to the limited number of programs and program seats available. Therefore, there is a need to introduce additional, equally viable career programs.

Meetings with representatives from the 1199SEIU League Training and Upgrading Fund indicate significant interest in a new Radiologic Technology program for its members who are currently employed in health care. The proposed program will address specific scheduling issues presented by these students and non-traditional course scheduling such as on evenings and weekends can be incorporated into the design of the program.

Clinical experiences can be scheduled throughout the week and during day, evening and night shifts as well as on weekends to accommodate student scheduling needs.

Department of Student Development personnel has enthusiastically endorsed this proposed program and has agreed to schedule the shadowing of practicing professionals prior to implementation to strengthen their understanding of the work environment and scope of practice for radiologic technologists. This will better equip them to help potential students select the right profession and may increase retention in the program.

Bronx Community College, New York City Technical College and Hostos Community College offer the A.A.S. in Radiologic Technology. Other programs are offered by Methodist Hospital, Long Island College Hospital, Harlem Hospital and St. Barnabas Hospital.

4. Curriculum

The curriculum is designed to prepare students who will succeed in earning State and national credentialing and are ready to work anywhere in the United States as highly qualified radiologic technicians. The curriculum includes the science of human anatomy all health technicians must know and is prerequisite to clinical courses, and the humanities, social science and other general education courses, which are essential for all associate degree graduates, provide a foundation for further higher education and help create a well-rounded individual and citizen. The curriculum meets the NYSED minimum in liberal arts and sciences with 20 general education credits and 2 credits in pathophysiology (RAD 241). To meet both NYSED and ASRT curriculum standards for program registration and accreditation, the proposed AAS in Radiologic Technology will need a waiver of the 60-credit limit for associate degree programs.

A. Description of New Courses

101 Radiologic Technology I

Credit

3

Overview of the radiology profession, patient care, medical terminology and medical ethics. The fundamental elements of each of these areas will be presented. The concepts of ethics, medical asepsis, vital signs and medical emergencies will be presented. The essentials of patient care including consideration for the physical and psychological needs of the patient and family and the practitioner's role in the health care system.

202 Radiologic Technology II

Credit

3

The components, principles and operations of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving and retrieval are discussed. Guidelines for selecting exposure factors and evaluating images within a digital system assist students to bridge between film-based and digital imaging systems. Principles of digital system quality assurance and maintenance are presented.

303 Radiologic Technology III

Credit

3

Overview of hospital administration, including employment issues, labor contracts and litigation processes. Radiation biology and the principles of interaction of radiation with living tissues are discussed. Acute and chronic effects will be discussed. Quality Assurance involves the evaluation of radiographic images along with their delivery systems. State and federal guides are included. Equipment Quality Control and its testing are discussed.

110 Radiographic Procedures I

Credit

2

This course is designed to provide the knowledge and skills necessary to perform radiographic procedures. This is the first in a series of courses dealing with principal techniques, radiographic anatomy, radiographic procedures and related terminology in the production of images of the chest, abdomen, upper and lower extremities. The production of images of optimal diagnostic qualities is stressed. In the laboratory portion of the course students use phantom apparatus.

111 Radiographic Procedures II

Credit

2

A continuation of Radiographic Procedures I. Emphasis is placed on the pelvis girdle, vertebral column, thoracic cavity and cranium studies. The production of images of optimal diagnostic qualities is stressed. In the laboratory portion of the course students use phantom apparatus.

312 Radiographic Procedures III

Credit

2

The more advanced positions utilized in the practice of medical imaging. Introduction to the more advanced studies that involve the use of contrast media, pediatrics, trauma and mobile radiography. The basic concepts of pharmacology are presented. The theory and practice of basic techniques of venipuncture are introduced. Practicum laboratory experiences complement the didactic portion of the course, allowing the student to demonstrate ability on the phantom patient.

120 Radiologic Exposure I

Credit

1

The principles of electromagnetic radiation and its effects upon living tissue. Stressed is the importance of radiation protection for patients and personnel is stressed. Emphasis is placed on the physics and the concepts of electronic involvement in the production, use and control of the various electromagnetic energies that are used in medical and diagnostic applications. This course heightens the student radiographers' awareness regarding the nature of ionizing radiation and their effect on all biological material.

121 Radiologic Exposure II

Credit **1**

Factors that govern and influence the production and recording of radiologic images. Film and electronic imaging with related accessories will be emphasized.

240 Cross-Sectional Anatomy

Credit **2**

The anatomical structures of the human body in various axial planes. Instructional aids will include radiographs, CT images and MRI images and anatomical models. There will be frequent correlation between radiographs, CT images and MRI images; knowledge that is essential when rotating through CT and MRI.

241 Pathology for Radiography

Credit **2**

The biological, physical, chemical and anatomical changes that occur in different disease processes. Also addresses the etiology and pathogenesis of disease states and the physiological changes that accompany altered body states.

250 Imaging Modalities I

Credit **3**

Principles related to computed tomography (CT) Imaging for entry level radiography students.

252 Imaging Modalities II

Credit **3**

Continues the study and skills associated with the more advanced and complex diagnostic procedures including vascular angiography, myelography, arthrography, venography and mammography.

260 Film Evaluation and Critique

Credit **1**

Evaluation and critique of radiographic images to improve the radiographic quality by understanding the radiographic imperfections. Through these evaluations students will be able to limit their retakes, improve the patient quality of care as well as the radiographic quality of their films. Student projects, associated film presentations and class critiques are conducted.

266 Quality Assurance

Credit **1**

Introduction of the principles of quality assurance and quality control and their relationship to excellence in radiography. Students are introduced to the standards and

regulations for radiation protection for both the patient and radiographer.

100 Clinical I

Credit

1

Introduction to the clinical environment at an affiliated clinical site. This is the first primary contact between students and patients. Students are assigned to various work areas within the radiology department in order to observe the operations of the entire department. Students are assigned to work under the close supervision of a licensed radiologic technologist while practicing and improving medical imaging skills with emphasis on chest, abdomen and upper extremities.

220 Clinical II

Credit

2

Continued practice and improvement of students' imaging skills at the assigned clinical affiliate under the guidance of a registered licensed radiologic technologist. Introduction to the principles of medical imaging of the lower extremities, pelvic girdle and vertebral column are presented.

221 Clinical III

Credit

3

This is a continuation of the two previous clinical practicums to improve skills in all routine and contrast media imaging procedures under supervision of a registered and licensed Radiologic Technologist. Students will assume more responsibilities in the diagnostic imaging process. The didactic information previously presented in Radiographic Procedures I and II are coordinated with assigned rotations at the affiliated clinical sites. The application of critical thinking skills is emphasized. This is a full-time six-week clinic with a weekly clinical conference.

222 Clinical IV

Credit

2

The practice and improvement of students' skills in the areas of general diagnostic procedures, contrast media procedures, advanced imaging procedures and skull imaging at the assigned medical facility under close supervision with a registered and licensed Radiologic Technologist. Specialty areas such as Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Invasive procedures and Angiographic Procedures are introduced.

223 Clinical V

Credit

3

The practice and improvement of students' skills in general diagnostic procedures, contrast media procedures, advanced imaging procedures and skull imaging at the assigned medical facility under close supervision by a registered and licensed Radiologic Technologist. This is a full-time six-week clinic with a weekly clinical conference.

224 Clinical VI

Credit

2

During this second to last clinical experience at the designated clinical site, students will complete all initial, continuous clinical competency evaluations and objectives prior to beginning the Final Competency Evaluations during the final clinical rotation.

225 Clinical VII

Credit

3

During this final clinical experience the students will exercise independent judgment and discretion in the technical performance of medical imaging procedures. Students must complete competency evaluations in ten required categories. Competencies are to be demonstrated on patients and simulators. This is a full-time six-week clinic with a weekly clinical conference. There is a Registry Review during the last week and a summative final examination for the whole program content.

The entire curriculum outline follows on the next page.

Kingsborough Community College
A.A.S. in Radiologic Technology Curriculum Outline

Course number		Lecture	Lab	Clinic	Credit
101	Radiologic Technology I	3			3
202	Radiologic Technology II	3			3
303	Radiologic Technology III	3			3
110	Radiographic Procedures I		6		2
111	Radiographic Procedures II		6		2
112	Clinical I			96	1
120	Radiologic Exposure I		3		1
221	Radiologic Exposure II		3		1
312	Radiographic Procedures III		6		2
240	Cross-Sectional Anatomy	2			2
250	Imaging Modalities I	3			3
252	Imaging Modalities II	3			3
241	Pathology for Radiography	2			2
260	Film Evaluation and Critique		3		1
266	Quality Assurance		3		1
220	Clinical II			196	2
221	Clinical III (Six Week)		3	240	3
222	Clinical IV			196	2
223	Clinical V (Six Week)		3	240	3
224	Clinical VI			196	2
225	Clinical VII (Six Week)		3	240	3
				1404	45
General Education					
12	English 12 (Six Week)	4			4
24	English 24	3			3
15	Anatomy and Physiology for Allied Health	6		12	6
25	Applied Physical Science for Allied Health	3			3
11	General Psychology (Six Week)	3			3
31	Medical Calculations	1			1
					20

Radiologic Technology Program Full-Time (4 semester) Plan of Study

Fall / Winter

31	Medical Calculations	1
15	Anatomy and Physiology for Allied Health*	6
11	General Psychology	3
101	Radiologic Technology I	3
110	Radiographic Procedures I	2
120	Radiologic Exposure I	1
112	Clinical I	1
12	English 12 (Six Week)	4

Spring / Summer

25	Applied Physical Science for Allied Health	3
202	Radiologic Technology II	3
221	Radiologic Exposure II	1
111	Radiographic Procedures II	2
113	Clinical II	2
220	Clinical III (Six Week)	4

Fall/ Winter

240	Cross-Sectional Anatomy	3
250	Imaging Modalities I	4
241	Pathology for Radiography	2
312	Radiographic Procedures III	2
303	Radiologic Technology III	3
222	Clinical IV	2
223	Clinical V(Six Week)	3

Spring / Summer

24	English 24	3
252	Imaging Modalities II	3
260	Film Evaluation and Critique	2
266	Quality Assurance	2
224	Clinical VI	2
225	Clinical VII (Six Week)	3

5. Faculty

Faculty of the Radiologic Technology Program will meet or exceed the minimum requirements of the JRCERT and New York State:

There will be a full-time Program Director who holds, at a minimum, a master's degree;

is proficient in curriculum design, program administration, evaluation, instruction and counseling; has the equivalent of three years full-time experience in the profession; has two years experience as an instructor in a JRCERT accredited program; and holds American Registry of Radiologic Technologists certification or equivalent.

There will be a full-time Clinical Coordinator who holds, at a minimum, a baccalaureate degree; is proficient in curriculum development, supervision, instruction, evaluation and counseling; has the equivalent of two years full-time experience in the professional discipline; has a minimum of one year of experience as an instructor in a JRCERT accredited program; and holds American Registry of Radiologic Technologists certification.

Program faculty will be hired who are qualified to teach the subject, knowledgeable about course development, instruction, evaluation and academic counseling; and hold appropriate professional credentials.

Sufficient numbers of instructors will be hired so that no more than a 10:1 student-to-faculty ratio will be maintained for the program overall and at least a 1:1 student-to-practitioner ratio in clinical assignments.

6. Facilities, Laboratory Equipment, Supplies and Library Materials

Kingsborough Community College already offers a Physical Therapy Assistant program which requires approximately the same laboratory, classroom and faculty office space as a Radiologic Technology program. Some of this equipment can be acquired by donation, rented or borrowed. The largest expenditure will be for the digital radiography equipment and simulators and room modifications to meet radiation safety parameters. These costs can exceed \$300,000 if state-of-the-art new equipment is selected. Older equipment that has been replaced in a medical facility can sometimes meet the needs of a program and be significantly less costly and this option will be pursued. Digital equipment is more costly than film systems but the on-going cost of films, dark rooms and film development equipment and chemicals soon overcome what is initially saved. For this expenditure, the College is seeking external funds. However, the lack of external funds will not preclude the Program's developed, as the College is committed to allocating College funds to support it, if necessary.

Professional journals and supporting texts will be added to the Kibbee Library in sufficient numbers to support students' course assignments. The Library will provide access to Medline. Local hospital libraries can also be appropriate resources, and will meet all national standards as long as the arrangement is established and is known to students including any conditions for access students must follow.

7. Cost Assessment

Annual budgets for typical Radiologic Technology programs include on-going disposable supplies, equipment needs, faculty development and accreditation fees. The initial purchase of equipment for a Radiologic Technician Laboratory can reach \$200,000. Appropriate

space on or off-campus is being pursued. Faculty salaries are comparable to those incurred at Kingsborough for the current Nursing, PTA and Surgical Technician programs' faculty and directors, which range from \$65,000 to \$85,000. External funds will be sought for the initial equipment costs and the salaries for new faculty will be incorporated into the College's strategic planning and budgeting process.