



Missouri Department of Higher Education

Building Missouri's future...by degrees

NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s): Linn State Technical College

Program Title: Radiologic Technology

Degree/Certificate: Associate of Applied Science Degree

Options: None

Delivery Site(s): Jefferson City, Missouri

CIP Classification: 51.0907 (Please provide a CIP code)

Implementation Date: Fall 2013

Cooperative Partners: None

AUTHORIZATION:

Vicki Schwinke, Dean of Academic & Student Affairs

*Vicki Schwinke* 6/29/12

Name/Title of Institutional Officer

Signature

Date

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Person to Contact for More Information

Telephone

**1. Need:**

**A. Student Demand**

- i. **Estimated enrollment for the first five years of the program for full-time and part-time students:**

**Form SE  
STUDENT ENROLLMENT PROJECTIONS**

Year	1	2	3	4	5
Full Time	15	15	17	17	20
Part Time	0	0	0	0	0
Total	15	15	17	17	20

- ii. **Will enrollment be capped in the future?**

Enrollment will be capped at 20 admitted students per year starting in year 5. If future trends and demand warrant increased enrollment, additional faculty (maintaining a 10:1 student/clinical instructor ratio at clinical sites), classrooms, clinical sites, equipment and other relevant factors will be assessed prior to expansion.

**B. Market Demand**

- i. **National, state, regional, or local assessment of labor need for citizens with these skills:**

The national need for radiologic technologists is well documented with significant increased need projected until 2020. In the 20010-20 Occupational Outlook, the US Department of Labor noted that employment of radiological technologists is expected to grow 28 percent between 2010 and 2020, much faster than the average for all occupations. This growth is due to a rise in radiologic procedures due to the aging population and expanding technologies such as diagnostic imaging for diagnosis. Employment of radiologic technologists in 2010 was 219,000 with a projected increase to 280,000 in 2020 (<http://www.bls.gov/ooh/healthcare/print/radiologic-technologists.htm>). As radiologic services expand and the demand increases nationally as well as locally, it is imperative that we plan educational programs to meet this need.

Missouri also has a shortfall of radiological technologists. According to the Missouri Department of Economic Development, the need for radiologic technologists is 128 annually depending on the region of Missouri with the highest demand in the St. Louis area. Projections from the Missouri Hospital Association show a growth rate of 5.0 to 9.9% from 2008-2018; however, a radiologic technologist degree is prerequisite to specialty areas of radiation which are projected to grow between 5.0-19.9% in the same period (<http://missourihealthcareers.com/a-job-for-me/diagnostic-imaging>).

Another variable impacting the market demand is the new certification requirement established by the American Registry of Radiologic Technologists (ARRT). Starting January 1, 2015, all candidates applying for certification must have earned an associate, baccalaureate, or graduate degree from an institution accredited by a mechanism acceptable to the ARRT (<https://www.arrt.org/new/2009-09-17-ARRTSetsDegreeRequire.html>). As a result Linn State Technical College will assume sponsorship of the existing certificate program at Nichols Career Center and expand the program to an Associate of Applied Science degree while continuing to meet the needs of the region.

### **C. Societal Need**

#### **i. General needs which are not directly related to employment:**

As noted above, a national and state need for radiologic technologists is currently present. With a 28% growth of the profession as predicted by the US Department of Labor over the next 10 years and as much as a 19.9% shortfall of radiologic technologists predicted in Missouri by 2018. Projections through 2018 by the Missouri Department of Elementary and Secondary Education show the shortage continuing at this high rate with 1,283 job openings for Radiologic Technologists and Technicians over 10 years (2008-18) ([http://dese.mo.gov/divcareered/documents/MCE\\_Missouri\\_Hot\\_Jobs\\_2008-2018.pdf](http://dese.mo.gov/divcareered/documents/MCE_Missouri_Hot_Jobs_2008-2018.pdf)).

### **D. Methodology used to determine "B" and "C" above:**

To establish the regional need, a survey was distributed to 15 mid-Missouri hospitals within a 60 mile radius of Jefferson City in April 2011. The survey addressed number of positions, vacant positions, educational preparation, certification, turnover rate, sources of support and benefit to institution (See Appendix A). Nine of the fifteen surveys were completed and returned.

One hundred and forty two full time equivalent radiological technologist positions existed in the nine facilities ranging from 3 to 50 FTE. One institute had no radiological technologist. The majority (n=7) reported 5 or greater FTE. Of the 142 radiological technologists reported, the majority indicated educational preparation at a two year college. Additionally, all radiological technologists were nationally certified.

Vacancies were currently reported as low and turnover rates were variable depending on the facility. All facilities noted that no vacancies exist; however, the one year turnover rates averaged 4% and the five year turnover averaged 9.74%. Turnover rates ranged from 0% to 10% at one year and 0.2% to 47.8% at five years. It is important to note that the current needs in mid-Missouri are being met. The driving force for this change is the new 2015 requirement for an associate degree to gain certification. Those schools that currently offer only a diploma must change to an associate degree by 2015 or there will not be enough radiologic technologists to meet the needs of mid-Missouri.

Seven of the eight institutions would provide support of an associate degree radiological technology program in the form of donations, clinical experiences, and/or service on an advisory board.

- 2. Duplication and Collaboration: If similar programs currently exist in Missouri, what makes the proposed program necessary and/or distinct from the others at public institutions, area**

**vocational technical schools and private career schools? Does delivery of the program involve a collaborative effort with any external institution or organization?**

According to the Joint Review Committee on Education in Radiologic Technology (JRCERT) there are currently five institutions in Missouri which offer the Associate of Applied Science (AAS) degree in Radiologic Technology: three programs at public community colleges in Kansas City, St. Louis, and Sedalia and two programs at private universities in Kansas City and St. Louis. There are four Associate in Science programs in Missouri: one program at a public community college in Park Hills, two programs at public universities in Cape Girardeau and Joplin, and one program at a private college in Springfield. There are currently no Associate degree programs within a 60 mile radius of Jefferson City and yet there are multiple hospitals and clinics that depend upon these professionals for quality healthcare services. Because of the large healthcare presence in and around Jefferson City and the pending degree requirement for Radiologic Technologists, a Radiologic Technology Program in Jefferson City is a valuable resource for hospitals, clinics, and health centers.

Delivery of this program currently involves collaborative efforts with seven regional hospitals/clinics. These efforts will be sustained under the Linn State Technical College sponsorship.

### **3. Program Structure: Form PS**

**A. Total credits required for graduation: 73 credit hours**

**B. Residency requirements, if any:** In compliance with the Missouri Department of Higher Education regulation 6 Code of State Regulations 10-3.010, the burden of proof in establishing residency rests with the student. Specific guidelines are described in detail in the Linn State Technical College catalog.

**C. Courses and credits required for general education: 19 credit hours**

**General Education Courses that are Prerequisite for Admission – 6 credit hours**

English Composition	3 credit hours
Or	or
Honors Composition	3 credit hours

And and

College Algebra	3 credit hours
Or	or
College Algebra Using Mathematical Modeling	3 credit hours
Or	or
Survey of College Mathematics	3 credit hours
Or	or
Pre-Calculus	5 credit hours
Or	or
Elements of Calculus	3 credit hours
Or	or
Calculus I	5 credit hours

**General Education Courses Included in the Program – 13 credit hours**

Oral Communications 3 credit hours  
Or  
Public Speaking 3 credit hours

And and

Physical Science with Lab 4 credit hours  
Or  
College Physics with Lab 4 credit hours  
Or  
Environmental Science with Lab 4 credit hours  
Or  
General Physics with Lab 5 credit hours  
Or  
A science course with lab 4 credit hours

And and

American Government 3 credit hours  
Or  
American History to 1877 3 credit hours  
Or  
American History from 1877 to the Present 3 credit hours

And and

Introduction to Microcomputer Usage 3 credit hours  
Or  
Advanced Microcomputer Usage 3 credit hours

**D. Courses and credits required for major: 54 credit hours**

RAD 108 Medical Terminology I 3 credit hours  
RAD 128 Medical Terminology II 3 credit hours  
RAD 101 Radiologic Patient Care 3 credit hours  
RAD 102 Radiologic Protection 2 credit hours  
RAD 111 Radiographic Clinical Education I 2 credit hours  
RAD 112 Radiographic Clinical Education II 2 credit hours  
RAD 113 Radiographic Clinical Education III 3 credit hours  
RAD 121 Radiographic Procedures and Lab I 2 credit hours  
RAD 122 Radiographic Procedures and Lab II 2 credit hours  
RAD 123 Radiographic Procedures and Lab III 2 credit hours  
RAD 131 Radiographic Exposures and Lab I 3 credit hours  
RAD 132 Radiographic Exposures and Lab II 2 credit hours  
RAD 141 Radiologic Physics I 2 credit hours  
RAD 142 Radiologic Physics II 2 credit hours

RAD 201	Radiologic Pathology	3 credit hours
RAD 202	Diagnostic Imaging QA	2 credit hours
RAD 203	Sectional Anatomy	2 credit hours
RAD 204	Radiobiology	2 credit hours
RAD 214	Radiographic Clinical Education IV	3 credit hours
RAD 215	Radiographic Clinical Education V	3 credit hours
RAD 224	Radiographic Procedures and Lab IV	2 credit hours
RAD 225	Radiographic Procedures and Lab V	2 credit hours
RAD 250	Curriculum Review	1 credit hour
BUS 125	Job Search Strategies	1 credit hour

**E. Number of free elective credits remaining (Sum of C, D, and E should equal A):** None

**F. Requirements for thesis, internship or other capstone experiences:**

Radiologic Technology students will participate in 5 semesters of clinical education at approved clinical sites in the central Missouri area.

**G. Any unique features, for example, interdepartmental cooperation:** None

Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.

**A. Student Preparation:**

- i. **Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.**  
The following Admissions Requirements must be submitted to the appropriate offices to be considered for the Radiologic Technology Program: proof of high school graduation or GED; minimum ACT score of 18; Ten college credit hours in Oral and Written Communications, Mathematics, and Science; Four hours of documented observation in a radiology department; a physical assessment; a personal interview; and a written explanation of previous healthcare experience.
- ii. **Characteristics of a specific population to be served if applicable: not applicable.**

**B. Faculty Characteristics:**

- i. **Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.**  
Faculty must hold a minimum of a baccalaureate degree in the field of radiology, three years related work experience, and be certified by the State Department of Elementary and Secondary Education to teach the skills and knowledge of the occupation taught by the program. In addition to the previous requirements, Department Chair positions include responsibility for the overall administration of the program within the policies and guidelines provided by the Dean of Academic and Student Affairs. The Department Chair supervises instructors and teaching aides assigned to the program and relates effectively with administrative officials, other Department Chairs, and instructors. Also, the position requires the ability to interact with program advisors and representatives of business and industry partnerships.
- ii. **Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (not FTE) in your descriptions here.**  
It is anticipated that more than 90% of the required courses will be taught by a full time faculty member.
- iii. **Expectations for professional activities, special student contact, teaching/learning innovation.**  
As expected of all faculty members at Linn State Technical College, faculty teaching in the proposed program will be expected to participate in professional development activities to keep them current in their respective fields of expertise. This may include, but not be limited to, attending the annual Missouri Society of Radiologic Technologists conference and acquiring the necessary continuing education credits to remain registered with the American Registry of Radiologic Technologists.

**C. Enrollment Projections:**

- i. **Student FTE majoring in program by the end of five years.**

FTE=100%

- ii. **Percent of full time and part time enrollment by the end of five years.**  
Full Time=100%; Part Time=0%

**D. Student and Program Outcomes:**

- i. **Number of graduates per annum at three and five years after implementation.**  
Year 3=15 graduates; Year 5=18 graduates
  
- ii. **Special skills specific to the program.**
  1. The radiologic technologist acts in a professional manner, responds to patient needs, and supports colleagues and associates in providing quality patient care.
  2. The radiologic technologist acts to advance the principal objective of the profession to provide services to humanity with full respect for the dignity of mankind.
  3. The radiologic technologist delivers patient care and service unrestricted by the concerns of personal attributes or the nature of the disease or illness, and without discrimination on the basis of sex, race, creed, religion, or socio-economic status.
  4. The radiologic technologist practices technology founded upon theoretical knowledge and concepts, uses equipment and accessories consistent with the purposes for which they were designed, and employs procedures and techniques appropriately.
  5. The radiologic technologist assesses situations; exercises care, discretion, and judgment; assumes responsibility for professional decisions; and acts in the best interest of the patient.
  6. The radiologic technologist acts as an agent through observation and communication to obtain pertinent information for the physician to aid in the diagnosis and treatment of the patient and recognizes that interpretation and diagnosis are outside the scope of practice for the profession.
  7. The radiologic technologist uses equipment and accessories, employs techniques and procedures, performs services in accordance with an accepted standard of practice, and demonstrates expertise in minimizing radiation exposure to the patient, self, and other members of the healthcare team.
  8. The radiologic technologist practices ethical conduct appropriate to the profession and protects the patient's right to quality radiologic technology care.
  9. The radiologic technologist respects confidences entrusted in the course of professional practice, respects the patient's right to privacy, and reveals confidential information only as required by law or to protect the welfare of the individual or the community.
  10. The radiologic technologist continually strives to improve knowledge and skills by participating in continuing education and professional activities, sharing knowledge with colleagues, and investigating new aspects of professional practice.
  
- iii. **Proportion of students who will achieve licensing, certification, or registration.**  
An average of seventy-five percent of the Radiologic Technology students will earn American Registry of Radiologic Technologists (ARRT) certification at the end of 5 years. This certification recognizes an individual as having satisfied quality standards within the profession.

- iv. **Performance on national and/or local assessments, e.g., percent of students scoring above the 50<sup>th</sup> percentile on normed tests; percent of students achieving minimal cut-scores on criterion-referenced tests. Include expected results on assessments of general education and on exit assessments in a particular discipline as well as the name of any nationally recognized assessments used.**

At least 50% of Radiologic Technology students will score at or above the 50<sup>th</sup> percentile on two of the four exams (Writing Skills, Mathematics, Critical Thinking, and Science Reasoning) on the CAAP test.

- v. **Placement rates in related fields, in other fields, unemployed.**

The placement rate in related fields is expected to be approximately 90%. The rates of placement in other fields and unemployment are expected to be approximately 10%.

- vi. **Transfer rates, continuous study.**

Transfer rates and continuous study are expected to be minimal.

**E. Program Accreditation:**

- i. **Institutional plans for accreditation, if applicable, including accrediting agency and timeline. If there are no plans to seek specialized accreditation, please provide reasons.**

The Radiologic Technology Program is currently accredited and in good standing by the Joint Review Committee on Education in Radiologic Technology until 9/1/2018. Because Linn State is applying for a Transfer of Sponsorship we will maintain the current accreditation.

**F. Alumni and Employer Survey:**

- i. **Expected satisfaction rates for alumni, including timing and method of surveys.**  
Alumni will be surveyed by USPS mail or electronically at five years post-graduation. The expected satisfaction rate is approximately 80%.
- ii. **Expected satisfaction rates for employers, including timing and method of surveys.**  
Employers will be surveyed by USPS mail or electronically three years after hiring a Radiologic Technology program graduate. The expected satisfaction rate is approximately 80%.

**6. Accreditation:**

The Radiologic Technology Program is currently accredited and in good standing by the Joint Review Committee on Education in Radiologic Technology until 9/1/2018. Because Linn State is applying for a Transfer of Sponsorship we will maintain the current accreditation.

**7. Institutional Characteristics:**

Linn State Technical College (LSTC) maintains a reputation for excellence in higher education. The college has been serving students with quality educational opportunities for over 50 years. LSTC has a proven track record of establishing and working with employer members of program advisory committees to develop and offer high-quality technology programs. Linn State Technical College prepares students for profitable employment and a life of learning.

LSTC is accustomed to offering a specialized medical program. LSTC was the first college in the state of Missouri to offer a physical therapist assistant program outside of Kansas City and St. Louis. The program is recognized for its success based on pass rates and now being offered in Poplar Bluff and Trenton.

The ability of Linn State Technical College graduates to enter and hold related employment is one of the most important indicators of the college's success. Since 1995, 95% of LSTC graduates have found gainful employment or continued their education within six months of graduation. The college confers 21% of the Associate degrees in Missouri in the areas of technical education and LSTC is A+ eligible which allows qualified graduates of A+ designated high schools to receive tuition reimbursement to attend Linn State.

Another important resource for Linn State students is the "lifelong" career services assistance program that was developed to assist graduates in obtaining employment in related occupations. The Career Services staff and college faculty have developed and maintained relationships with many of Missouri's businesses, industries and governmental agencies. Employer contacts are also available across the country.

**8. Any Other Relevant Information: None**