

Radiologic Science Degree Completion Program

2011-2012 Assessment Report

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**Oregon Institute of Technology
Medical Imaging Technology Department
Radiologic Science Degree Completion Program Assessment
2011-2012**

I. Introduction

The Radiologic Science (RDSC) Degree Completion Program began in 1996 and is one of four degree completion programs offered by the Department of Medical Imaging Technology at Oregon Institute of Technology.

The structure of the program allows registered radiologic technologists (RT) to pursue their Bachelor of Science degrees without coming to campus. This is accomplished by using the medical facilities where students are employed (or of their choice) as sites for temporary clinical practice, to fulfill the requirements of courses with labs, and the external capstone course, RDSC 411.

Eighty-eight credits are granted for the core radiography curriculum for registered technologists in good standing with the American Registry of Radiologic Technology (ARRT). A 62 credit block of math, communications, science, and remaining general education credits are taken from OIT courses available online, or at a college in the student's locale. The remaining block of 50 credits is taken online from OIT.

During the early years of the program enrollment was slow, with little increase. The creation of a dedicated distance education office was greatly beneficial in promoting the program. From the Fall of 2002, through the Fall of 2007, the number of students coming into the program were 8, 8, 8, 12, 25, and 29, respectively. The number of graduates from 2002 through 2006 were 1, 2, 3, 1, and 4, respectively. As of spring, 2011, eight were notified of being eligible to graduate. Spring of 2012 will see another seven.

II. Mission, Objectives, and Student Learning Outcomes

Radiologic Science Degree Completion Program Mission Statement:

The mission of the Radiologic Science Degree Completion Program is to provide ARRT registered Radiologic Technologists a Bachelor of Science degree from a distance education program that furthers the student's knowledge, clinical practice, and performance of examinations while practicing competent patient care and safety in the advanced modalities of Radiologic Technology.

Program Objectives:

1. Maintain a degree completion curriculum with emphasis on special modalities.
2. Provide a BS degree in Radiologic Science with a core of courses directly applicable to the technologist-student seeking advancement or a leadership role in the profession.
3. Further the distance student's practice of providing compassionate healthcare in the clinical setting
4. Prepare graduates to obtain positions in the advanced modalities, management, sales, applications, education, and other career options available to Bachelor of Science degree graduates.
5. Place students in the clinical setting of various modalities, enabling them to gain hands-on experience and form new networks.
6. Provide a quality degree program that recognizes the achievement of passing the national registry.
7. Address quality of healthcare issues through the continued learning of working professionals.
8. Provide a meaningful capstone experience in one or more advanced imaging modalities.

Student Learning Outcomes:

1. Demonstrate knowledge of concepts & principles associated with the operation of special modality imaging machines & equipment.
2. Identify arteriographic anatomy and cross sectional images of the head, neck, and torso, for specific accuracy and spelling.
3. Demonstrate magnetic field precautions and radiation safety for self, staff, and patients as set forth by the ALARA standards.
4. Demonstrate professional judgment and appropriate interpersonal communication with colleagues and superiors.
5. Perform clinical examinations in Computed Tomography, Magnetic Resonance, Arteriography, and Mammography or Quality Assurance at the level of competency.
6. Identify major disease processes diagnostic to advanced modality examinations.

III. SLO Three Year Assessment Cycle

A three-year cycle for the assessment of the program’s student learning outcomes is shown below in Table 1.

| Radiologic Science Outcome Assessment | 2010-2011 Term/Course | 2011-2012 Term/Course | 2012-2013 Term/Course | |
|--|----------------------------------|----------------------------------|----------------------------------|--|
| 1. Demonstrate knowledge of concepts & principles associated with the operation of special modality imaging machines & equipment (Alternates:CT, Mamm, QA) | S | | W | |
| 2. Identify arteriographic anatomy and cross sectional images of the head, neck, and torso, for accuracy and spelling. | F | | S | |
| 3. Demonstrate magnetic field precautions and radiation safety for self, staff, and patients as set forth by the ALARA standards. (Alternates: CT, CIT,Mamm) | | W | | |
| 4. Demonstrate professional judgment and appropriate interpersonal communication with colleagues and superiors. | | F | | |
| 5. Perform clinical examinations in Computed Tomography, Magnetic Resonance, Arteriography, and Mammography or Quality Assurance at the level of competency | | S | | |
| 6. Identify major disease processes diagnostic to advanced modality examinations | W | | F | |

Table 1. Three year Assessment Cycle

IV. 2011 – 2012 Assessment Activities

A. Winter 2012, RDSC 356 Magnetic Resonance, RDSC 411 Externship

Student Learning Outcome #3. Demonstrate magnetic field precautions and radiation safety for self, staff, and patients as set forth by the ALARA standards.

Direct Assessment 1. Relevant questions from unit

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|----------------------|-------------------|-------------------|--------------------------------|---------|
| Test 3, Q 1 | MC question | % correct | 75% | 100% |
| Test 3, Q 9 | MC question | % correct | 75% | 85% |
| Test 3, Q 27 | MC question | % correct | 75% | 100% |
| Test 3, Q 29 | MC question | % correct | 75% | 100% |

Table 2. Assessment Results for SLO #3, Winter, Spring 2012,

Indirect Assessment 1: Self-assessment of this outcome was also conducted on the exit survey, which was worded the same as the outcome.

Exit survey results: 4 respondents: Highly prepared 1/4 Prepared 3/4

Indirect Assessment 2 : Student comments from the weekly journal of anecdotal reports

I was able to review radiation safety in my text books this past week. I have discussed this project with my administrator and am working with her on the education portion along with the implementation. The medical staff I work with can be resistant sometimes but if presented correctly I believe they will appreciate the importance of radiation safety.

The technical aspects are still being smoothed out but I think my best asset is patient care. I really try to explain every step of the exam to the patient so they know what to expect. It makes for a smoother and relaxed atmosphere during the scan.

There has been lots of snags in getting all of the information that I need for this paper and getting the opportunity to listen to patient voices.

CT is going well, gaining the confidence with explaining the details of the exams to patients.

Indirect Assessment 3: Incidents or safety violations (if any) reported by student or clinical staff.

No incidents were reported

Strengths, Weaknesses, Actions.

On review of the tests in the MRI course a lack of questions regarding safety was apparent. Chapter assignments in the text are the reason. Magnetic safety is an important topic that will be reviewed before this course is offered again.

B. Fall, Winter, Spring 2011-2012, RDSC 411: Externship

Student Learning Outcome #4. Demonstrate professional judgment and appropriate interpersonal communication with colleagues and superiors.

Due to the limited number of students taking this course, data was collected throughout the year and compiled at the end of spring term. Three students completed this course.

Direct Assessment: Clinical Instructor’s professional evaluations

Three students were evaluated, twice each during the term, resulting in 6 professional evaluations of affective attitudes and behaviors. Items that pertained to professional judgment and appropriate communication are as follows. There were no comments specific to these items.

| Performance Criteria | Assessment Method | Measurement Scale | Min. Acceptable Performance | Results 1 st evals / 2 nd evals |
|---|---------------------|-------------------|-----------------------------|--|
| 7. Judgment/ critical thinking | % score or comments | % score | 80% | 90,100,100 / 100,100,100 |
| 8. Professional ethics | % score or comments | % score | 80% | 100,100,100 / 100,100,100 |
| 10. Attitude toward criticism | % score or comments | % score | 80% | 100,100,100 / 100,100,100 |
| 11. Attitude assigned tasks | % score or comments | % score | 80% | 100,100,100 / 100,100,100 |
| 15. Interpersonal relationships-patients | % score or comments | % score | 80% | 90,100,100 / 100,100,100 |
| 16. Interpersonal relationships-all staff | % score or comments | % score | 80% | 100,100,100 / 100,100,100 |

Table 3. Assessment Results for SLO #4 in RDSC 411 Fall, Winter, Spring, 2011-2012

Indirect Assessment 1: Student comments taken from the weekly journal of anecdotal reports

During the scan Joe, the technologist, showed me how to shorten the scan time by changing the phase encoding direction. We usually have the PE direction going from left to right on a foot, but on the toes I could change it to anterior/posterior, which allowed me to decrease the PE FOV and shorten my times by almost half.

This week was another upper extremity week in MR. There were 4 elbows to image and each one required a different protocol. The exams were a good learning experience. I am learning how important it is to carefully review the order and paperwork and what to look for so the radiologist have what they need to make a diagnosis.

Indirect Assessment 2: Exit survey results of 4 respondents

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|-------------------|--|--------------------------------|---|
| Demonstrate professional judgment and appropriate interpersonal communication with colleagues and superiors | Self assessment | High proficiency, Proficiency, Some proficiency, No proficiency | Proficiency | High 4/4 Proficiency 0/4 Some 0/4 No 0/4 |
| Oral communication | Self assessment | High proficiency, Proficiency, Some proficiency, No proficiency | Proficiency | High 2/4 Proficiency 2/4 Some 0/4 No 0/4 |
| Written communication | Self assessment | High proficiency, Proficiency, Some proficiency, No proficiency | Proficiency | High 3/4 Proficiency 1/4 Some 0/4 No 0/4 |
| Professionalism | Self assessment | High proficiency, Proficiency, Some proficiency, No proficiency | Proficiency | High 3/4 Proficiency 1/4 Some 0/4 No 0/4 |

Table 4. Assessment Results for SLO #4, Fall, Winter, Spring 2012

Strengths, Weaknesses, Actions.

Samples show no deficiencies warranting attention.

C. Winter and Spring 2012, RDSC 326 CIT and RDSC 411 Externship

Student Learning Outcome #5. Perform clinical examinations in Computed Tomography, Magnetic Resonance, Arteriography, and Mammography or Quality Assurance at the level of competency

Direct Assessment 1: Relevant questions from unit tests in RDSC 326

Eleven students completed the CIT course. Seventeen test questions on equipment use were selected for sampling: nine on power injectors, and eight on identification of monitors and related functions. Results have been carried over from the last assessment of these items to add validity to the limited sampling.

| Performance Criteria | Assessment Method | Measurement Scale | Min. Acceptable Performance | Results Last survey/this survey |
|----------------------|-------------------|-------------------|-----------------------------|---------------------------------|
| Q. D1.06 | MC | % Correct | 75 % | 57% / 73% |
| Q. D1.09 | MC | % Correct | 75 % | 100% / 91% |
| Q. D1.06 | MC | % Correct | 75 % | 100% / 100% |
| Q. D1.10 | MC | % Correct | 75 % | 100% / 100% |
| Q. D1.11 | MC | % Correct | 75 % | 85% / 91% |
| Q. D1.12 | MC | % Correct | 75 % | 100% / 100% |
| Q. D1.13 | MC | % Correct | 75 % | 100% / 100% |
| Q. D1.14 | MC | % Correct | 75 % | 100% / 91% |
| Q. D1.15 | MC | % Correct | 75 % | 100% / 64% |
| Q. D1.19 | MC | % Correct | 75 % | 100% / 100% |
| Q. D1.20 | MC | % Correct | 75 % | 71% / 64% |
| Q. D1.46 | MC | % Correct | 75 % | 85% / 100% |
| Q. D1.47 | MC | % Correct | 75 % | 100% / 100% |
| Q. D2.41 | MC | % Correct | 75 % | 42% / 73% |
| Q. D2.42 | MC | % Correct | 75 % | 100% / 73% |
| Q. D2.44 | MC | % Correct | 75 % | 85% / 36% |
| Q. D2.45 | MC | % Correct | 75 % | 100% / 91% |

Table 5. Assessment Results for SLO #5 in CIT, Spring, 2012

Indirect Assessment 1: Exit survey results, 4 respondents

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|--|-------------------|---|--------------------------------|--|
| Demonstrate knowledge of concepts & principles associated with the operation of special modality imaging machines & equipment. | Self-assessment | Highly prepared, Prepared, Inadequately prepared | Prepared | High 2/4 Prepared 2/4 Inadequate 0/4 |
| Perform clinical examinations in Computed Tomography, Magnetic Resonance, Arteriography, and Mammography or Quality Assurance at the level of competency | Self-assessment | Highly prepared, Prepared, Inadequately prepared | Prepared | High 1/4 Prepared 3/4 Inadequate 0/4 |
| Curriculum provides sufficient depth of information about specific topics | Self-assessment | Strongly agree Agree Disagree, Strongly disagree | Agree | Strongly agree 2/4 Agree 2/4 Disagree 0/4 Strongly Disagree 0/4 |
| Curriculum provides opportunities for hands-on experiences | Self-assessment | Strongly agree Agree Disagree, Strongly disagree | Agree | Strongly agree 2/4 Agree 2/4 Disagree 0/4 Strongly Disagree 0/4 |
| Curriculum provides provides sufficient opportunity to experience other modalities | Self-assessment | Strongly agree Agree Disagree, Strongly disagree | Agree | Strongly agree 2/4 Agree 2/4 Disagree 0/4 Strongly Disagree 0/4 |

Table 6. Assessment Results for SLO #5, Fall, Winter, Spring 2012

Indirect Assessment 2: Student comments taken from the weekly journal of anecdotal reports in RDSC 411

This week I learned a couple of valuable lessons. The first is the importance of the patient & position in and on the coil and I learned how phase encoding affects the time of the sequence, and how to recognize that it is the cause of an artifact. I was scanning a foot, actually toes, for osteomyelitis and noticed on the sagittal fatsat I had a loss of signal through the toes. The shim looked good, so I checked the coil to make sure it had closed properly. I re-shimmed and ran the fatsat again, but I still had the loss of signal. Hmmmm....I went back to the scan room and took a closer look and realized the foot was too far down into the coil. I moved the patient back about 2 inches, re-shimmed and the next set of images were fine.

Week 2 was the beginning of my sequence training. I am studying and learning the differences between the sequences and which protocols to use when looking for certain pathology. We have numerous protocols and each one contains sequences which are necessary for a particular pathology. The bone, spine protocol contains fatsat sequences for mets etc. I am learning that a significant part of MRI is a knowledge of the different sequences and when to apply them. I have also been studying MRI anatomy.

Good morning, this was another week of learning how to solve some of the problems that arise in MR. This week was the week of the humerus and the best coil to use. We had 3 separate cases that all required a different coil for the pathology. The first was a interavenous drug user that had cellulitis in the shoulder and mid arm. The shoulder coil

was too small and the wrap around was not long enough, so we had to use the whole body coil. The next case was a humeral head and proximal shaft injury. We were able to use the shoulder coil. The next was a mid humerus, torn muscle that we used the wrap coil to image. All 3 cases required a good understanding and knowledge of the coils and protocols.

During an abdominal scan I had an artifact going from top to bottom on my axial images and I had no idea what it was. It turned out that it was a combination of belly fat and normal breathing motion. Again, I had to change the PE direction from anterior/posterior to left/right, which cleared up the artifact. All the artifacts of MR are new to me. It was an interesting week and I was able to get signed off on an exam.

I did my first anesthesia case this week. It was interesting attempting to change out the coils without extubating the patient! All in all, it went well and I was able to learn the MR monitor and pump.

Strengths, Weaknesses, Actions.

Due to the sample size the percentages shown in Table 5 appear more dramatic than they actually are. Improvement versus digressions are fairly well balanced and do not indicate a trend. The course instructor will be given a copy of the results for consideration.

V. Summary of Student Learning Outcomes

The program faculty conducted formal assessment of three student learning outcomes during 2011-2012.

A. Fall, Winter, Spring 2011-2012, RDSC 411: Externship

Student Learning Outcome #4. Demonstrate professional judgment and appropriate interpersonal communication with colleagues and superiors.

No actionable deficiencies noted.

B. Winter 2012, RDSC 356: Magnetic Resonance

Student Learning Outcome #3. Demonstrate magnetic field precautions and radiation safety for self, staff, and patients as set forth by the ALARA standards.

The MRI course will be reexamined for the need to add material and test items to the subject of magnetic field safety.

C. Spring 2011, RDSC 336: RDSC 326 CIT & Externship

Student Learning Outcome #5. Perform clinical examinations in Computed Tomography, Magnetic Resonance, Arteriography, and Mammography or Quality Assurance at the level of competency

No actionable deficiencies noted.

VI. Changes Resulting from 2010-2011 Assessment

A. Spring 2011, RDSC 326: CIT

Student Learning Outcome #1. Demonstrate knowledge of concepts & principles associated with the operation of special modality imaging machines & equipment

Three questions below the benchmark were examined by the instructor for clarification of possible problematic concepts. No changes were made and additional data sampled this year showed no trends evident as the sample size increases.

Student learning outcomes have been mapped to the curriculum as shown in Appendix A.

Appendix A
SLO-Curriculum Matrix

| Course | Term | SLO 1 | SLO 2 | SLO 3 | SLO 4 | SLO 5 | SLO 6 |
|-----------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
| BIO 335 x-sec | 3 | | X | | | | |
| BIO 336 Patho | F | | | | | | X |
| RDSC 326 CIT | S | X | X | X | | | |
| RDSC 354 Mamm | S | X | | X | | | |
| RDSC 355 CT | F | X | | X | | X | |
| RDSC 356 MRI | W | X | | X | | | |
| RDSC 365 QA | S | X | | | | | |
| RDSC 366 R path | S | | | | | | X |
| RDSC 411 extern | 3 | | | | X | X | |