

Radiologic Science Degree Completion Program

2013-1014 Assessment Report

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**Oregon Institute of Technology
Medical Imaging Technology Department
Radiologic Science Degree Completion Program Assessment
2013-2014**

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-nine 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 for 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	2013-2014 Term/Course	2014-2015 Term/Course	2015-2016 Term/Course	
1. Demonstrate knowledge of concepts & principles associated with the operation of special modality imaging machines & equipment (Alternates:CT, Mamm, QA)		S		
2. Identify arteriographic anatomy and cross sectional images of the head, neck, and torso, for accuracy and spelling.		F		
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		W	
4. Demonstrate professional judgment and appropriate interpersonal communication with colleagues and superiors.	F		F	
5. Perform clinical examinations in Computed Tomography, Magnetic Resonance, Arteriography, and Mammography or Quality Assurance at the level of competency	S		S	
6. Identify major disease processes diagnostic to advanced modality examinations		W		

Table 1. Three year Assessment Cycle

IV. 2013 – 2014 Assessment Activities

A. RDSC 354 Mammography, 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 RDSC 356, Mammography

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Midterm, Q 4	MC question	% correct	75%	100%
Midterm, Q 5	MC question	% correct	75%	66%
Midterm, Q 6	MC question	% correct	75%	33%
Midterm, Q 21	MC question	% correct	75%	100%
Final, Q 36	MC question	% correct	75%	100%
Final, Q 48	MC question	% correct	75%	100%
Final, Q 41	MC question	% correct	75%	100%
Final, Q 44	MC question	% correct	75%	100%
Final, Q 45	MC question	% correct	75%	100%
Final, Q 52	MC question	% correct	75%	100%
Final, Q 80	MC question	% correct	75%	100%

Table 2. Assessment Results for SLO #3, Winter, Spring 2013-2014,

Indirect Assessment 1 : Samples of student discussions regarding safety issues.

The radiologist I spoke with said they are primarily only using this technology for patients with dense breasts. After the technologist makes the first exposure it is up to her discretion whether or not to utilize the tomosynthesis. I was curious about the additional radiation exposure, and he said it is about the equivalent of having 2 mammograms.

On one hospital's website I read that in the year they have had tomosynthesis they have increased their rate of cancer diagnosis by 38% and reduced call backs by 20-30%. Despite the additional radiation exposure I feel this could be a very beneficial tool for diagnosing cancers that otherwise may be missed, especially in younger patients with denser breasts.

We use Magnavist for breast imaging and Multihance for all other C+ exams. It is rare for a patient to have a reaction to gad, but we had one patient last week who experienced a mild reaction. We assessed and turned her over to Imaging RN, who monitored her for 30 mins.

Indirect Assessment 2: Self-assessment of this outcome was also conducted on the exit survey, which was worded the same as the outcome.

Exit survey results: 3 respondents: Highly prepared 2/3 Prepared 1/3

Indirect Assessment 3: Incidents or safety violations (if any) reported by student or clinical staff in RDSC 411, clinical practice.

No incidents or violations were reported.

Strengths, Weaknesses, Actions.

Indicators are positive. The 33% (missed twice) and 66% (missed once) on questions is deceptively low due to the number of students sampled being only three.

B. Fall, Winter, Spring 2013-2014, RDSC 411: Externship

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

Direct Assessment: Clinical Instructor’s professional evaluations: RDSC 411, Externship. Three students were evaluated, three times each during the term, resulting in 9 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 (x2), 100 (x7)
8. Professional ethics	% score or comments	% score	80%	90 (x1), 100 (x8)
10. Attitude toward criticism	% score or comments	% score	80%	90 (x2), 100 (x7)
11. Attitude assigned tasks	% score or comments	% score	80%	90 (x2), 100 (x7)
15. Interpersonal relationships-patients	% score or comments	% score	80%	90 (x1), 100 (x8)
16. Interpersonal relationships-all staff	% score or comments	% score	80%	100 (x9)

Table 3. Assessment Results for SLO #4 in RDSC 411 Fall, Winter, Spring, 2013-2014

Indirect Assessment 1: See Appendix B. Student comments taken from *Discussions*, in Mammography reflecting judgment in the manner the course work is approached, and communication required in the course that addresses the outcome.

Indirect Assessment 2: See Appendix C. Student comments taken from the weekly journal of anecdotal reports in RDSC 411, reflecting judgment in the manner the course work is approached, and communication required in the course that addresses the outcome.

Indirect Assessment 3: Exit survey results of 3 respondents

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

Table 4. Assessment Results for SLO #4, Fall, Winter, Spring 2013-14

Strengths, Weaknesses, Actions.

Samples show no deficiencies warranting attention.

C. Winter and Spring 2013-14, RDSC 354 Mammography, 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 Midterm test in RDSC 354

Three students completed Mammography. Fifteen questions on positioning were selected for sampling

Performance Criteria	Assessment Method	Measurement Scale	Min. Acceptable Performance	Results
Q.61	MC	% Correct	75 %	100%
Q. 62	MC	% Correct	75 %	100%
Q. 63	MC	% Correct	75 %	100%
Q. 64	MC	% Correct	75 %	100%
Q. 65	MC	% Correct	75 %	100%
Q. 66	MC	% Correct	75 %	100%
Q. 67	MC	% Correct	75 %	100%
Q. 68	MC	% Correct	75 %	66%
Q. 69	MC	% Correct	75 %	100%
Q. 70	MC	% Correct	75 %	66%
Q. 71	MC	% Correct	75 %	66%
Q. 72	MC	% Correct	75 %	100%
Q. 73	MC	% Correct	75 %	100%
Q. 74	MC	% Correct	75 %	100%
Q. 75	MC	% Correct	75 %	100%

Table 5. Assessment Results for SLO #5 in Mammography 2013-2014

Indirect Assessment 1: Exit survey results, 3 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 2/3 Prepared 1/3 Inadequate 0/3
Perform clinical examinations in Computed Tomography, Magnetic Resonance, Arteriography, and Mammography or Quality Assurance at the level of competency	Self-assessment		Prepared	High 2/3 Prepared 1/3 Inadequate 0/3
Curriculum provides sufficient depth of information about specific topics	Self-assessment	Strongly agree Agree Disagree, Strongly disagree	Agree	Strongly agree 2/3 Agree 1/3 Disagree 0/3 Strongly Disagree 0/3
Curriculum provides opportunities for hands-on experiences	Self-assessment		Agree	Strongly agree 2/3 Agree 1/3 Disagree 0/3 Strongly Disagree 0/3
Curriculum provides provides sufficient opportunity to experience other modalities	Self-assessment		Agree	Strongly agree 2/3 Agree 1/3 Disagree 0/3 Strongly Disagree 0/3

Table 6. Assessment Results for SLO #5, Fall, Winter, Spring 2013-14

Indirect Assessment 2: See Appendix D. Student comments taken from the weekly journal of anecdotal reports in RDSC 411, reflecting progress in CT, MRI and mammography.

Strengths, Weaknesses, Actions.

Samples show no deficiencies warranting attention

V. Summary of Student Learning Outcomes

The program faculty conducted formal assessment of three student learning outcomes during 2013-2014.

A. Fall, Winter, Spring 2013-2014, RDSC 411: Externship and RDSC 354 Mammography

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

No actionable deficiencies noted.

B. Winter 2013, RDSC 354: Mammography and 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.

No actionable deficiencies noted.

C. Spring 2013, RDSC 354 Mammography, 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

No actionable deficiencies noted.

VI. Changes Resulting from 2012-2013 Assessment

RDSC 356 , SLO 1 and 3. Magnetic Resonance Imaging

The course was redesigned around a newly adopted text, with attention paid to the areas of deficiency: T2 weighting and MR safety.

RDSC 326. Cardiovascular Interventional Technology

Results of assessment were copied to the instructor. No changes were deemed necessary.

RDSC 336: Pathophysiology

Three questions that were below the benchmark were examined by the instructor for clarification of possible problematic concepts.

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		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	

Appendix B

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

Indirect Assessment 1: Student comments taken from *Discussions*, in Mammography reflecting judgment in the manner the course work is approached, and communication required in the course that addresses the outcome.

I spoke with a radiologist at my employer hospital and a NM tech at the hospital I will be doing my clinicals at and they both commented that no one on island is performing scintimammography or breast specific gamma imaging. Of the 7 hospitals on island, only one even has PET available.

In talking with the radiologist, I asked him which patients would be candidates for NM studies and he said he wasn't sure as he'd never been at a facility that used it. He felt that this tests were rare and that MR is the standard.

We do not have stereotactic equipment at the facility where I work, but I spoke to the radiologist and she said stereotactic is especially useful to biopsy an area of microcalcification. She said if the area in question is visible by US, this is the preferred method for patient comfort reasons.

Anyway, our radiologist also explained to me that he can more accurately pinpoint microlesions that ultrasound may not be able to visualize as well.

When I spoke to our radiologist about this, he had a hard time describing what the images would look like...

The radiologist I spoke with said that MR is usually recommended for patients with implants as well as those who have been diagnosed with cancer to look for other lesions that may have been missed on mammo. It may also be used in patients who are high risk.

Technologist at my facility noted that they had not really heard much about MR breast imaging. However, they felt that the increased length of the exam and the inherent claustrophobia issues that accompany MRI might outweigh the benefits.

When I rotated through MRI I talked to the techs a bit about breast imaging.

I was able to observe a patient with breast implants and I was surprised by how much breast tissue that maybe can not be seen on normal mammogram. Really made me think about things and the things we or people do to our bodies how it can affect us later on.

I have been practicing what I'm going to say to the patients when I personally perform their mammogram. There is a lot of information to get from the patient and a lot of dialogue between the tech and the patient. Understandably, it's because of the intimacy of the exam, the fear of breast cancer that a lot of women experience, and the anxiety related to the breast compression.

The lead tech said that my interaction with the patients is getting much better. Probably because my comfort level has increased. So, I'm pretty happy about that.

Now that i have about 8 comps under my belt, I'm finding they are coming a bit easier. However, each patient is unique, as well as their breast tissue. I'm finding that each breast has its own "feel", so to speak. And each tissue requires a different technique to manipulate it into place under the compression paddle. This is a new revelation for me. I didn't realize there was such diversity in breast tissue!

They are teaching me well and explaining tips that will help me get through the process. I'm getting closer to completing my comps and have been fortunate enough to do almost all of them on my own time. I have a few more weeks to go and I'm confident that I'll be able to complete my course work in this one term. So, I'm happy.

Finally, I was able to get my last comp!!! I can't tell you how happy I amAlso, the women that I performed the final mammos on were extremely pleasant, willing to help me, and very encouraging. It was a great experience. After the last patient left, the mammo techs and I were all high-fiving each other and jumping up and down. It was a great accomplishment!

Appendix C

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

Indirect Assessment 2: Student comments taken from the weekly journal of anecdotal reports in RDSC 411, reflecting judgment in the manner the course work is approached, and communication required in the course that addresses the outcome.

I intentionally began working with different techs to get varied perspective on scan parameters and technique. I feel this was helpful. I have continued to study MR physics. I feel like I live and breathe magnetic dipoles at this stage in life! I am finding the challenge of MRI enjoyable.

During the time I spent in MRI, I received several positive comments from patients and staff.

I did a bit of review before the quarter, but thought I could pick it up along the way. I think picking it up along the way will happen, but a little more effort was needed in advance. So, all in all, I feel like week one was unproductive clinically, but really opened my eyes to some of the things I need to do to be successful this quarter!

The exam went as planned, introductions were made, the patient was informed about the procedure, all equipment and supplies were made available...

I feel week three continued my growth in MR. I still feel overwhelmed- but i am confident in my progress. I found myself having to reread many of the physics concepts yet again, but this time I feel that things are coming together better.

I feel like i am starting to see imaging from a mr perspective rather than trying to apply what i am comfortable with to mr. I feel like that is great progress. I am still slowly chipping away at comps. I have found a source for MRI articles and just need to choose the most appropriate

I am really enjoying MR. I have begun the dialog with my supervisor to continue modality training. It looks promising to continue.

It is always amazing to think of how integral Imaging is to health-care!

I haven't completed any comps yet, as I feel I need to observe more exams before I feel confident enough to interact with the patients. I'm still being a bit of a fly on the wall, just listening to the explanation of the exam by the techs and listening to how they answer questions by the patients.

I've decided that I need to be more aggressive in arranging to be available when mammogram exams become available. I may need to meet with my supervisor to arrange this. Regarding my journal article critique, I haven't made progress on this yet. I feel that I need to kick things into high gear and get going!

Overall, I'm feeling pretty good about where I'm at in the externship. I am a bit nervous about performing my first exam, but I feel that I'll do well. I'm ready to start completing the competencies, and once I do, I feel that my confidence will be higher.

Appendix D

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

Indirect Assessment 2: Student comments taken from the weekly journal of anecdotal reports in RDSC 411, reflecting progress in CT, MRI and mammography.

I am feeling pretty comfortable with most of the routine exams now, and look forward to participating in some of the more challenging exams like run-offs, pancreatic mass protocols, and liver triple phase protocols.

I'm training at a different facility within my company. Last week (6), I scanned a knee (with a lot of help from Tech), started numerous IV access', and injected plenty of Gad.

My third week was quite busy. I spent another 20 hours in the CT department and participated and performed many exams. During week three I successfully "comped" a CT chest with and without IV contrast, the ordering doctor was looking to r/o a dissection. I also reviewed some x-sectional anatomy. I plan to continue working diligently and getting as many exams under my belt as possible.

I have been keeping busy performing as many CT exams as I can get. I am feeling comfortable with most of our routine exams. After I finish this program I will be studying for the CT registry.

Im moving right along in the required comps for completing the class. This week I scanned and comped a CT lumbar spine without contrast. The doctor was looking for a compression fracture to the lower spine and we were able to obtain images for their request. I am feeling proficient at starting IV's, when I am helping in the "outpatient" core, most of the IV's are started by the techs, unless the patient already has a port access. This means most of our starts are 22g, unless we are doing an "angio" study then our policy requires at least a 20g IV. I have noticed different body habitus types can sometimes be less or more difficult to start an IV. Patient hydration also plays an important role in how easily a vessel will appear as well.

I spent more time during week 6 seeking out exams that were less routine. This week I scanned a tripple phase liver CT abdomen exam. This puts me over the required comps for the class, but I will keep plugging away until the term is up. Some of the other techs admitted that they haven't scanned a whole lot of inpatient tripple phase liver exams so I went ahead and followed the protocol book and got the scan that the doctor had ordered. The tripple phase looks at both the arterial and venous and non contrast images of the liver

Well we are getting close to the end of the term. I am feeling like I have had lots of hands on time in CT. I feel comfortable scanning most all exams we see with the exception of only a few rare exams that I would still need to look up in the protocol book. Im feeling like I could scan without supervision, so I think I am right where I should be in my externship progress.

Starting week 3, I will begin taking Protocol notes, to include patient position, scan area, sequences, and normal TE and TR settings. I intend to continue reviewing different sequences and what they are used for. I reviewed some basic MR physics and sequences and related that information back to the scans we were conducting. T1, T2, T2*, and PD weighting.

Busy week. A highlight was scanning a shoulder. Getting use to the GE buttonology is a bit difficult. Just need more time in the seat. Late last week and this week, I am training at a different facility. Gaining more experience preparing patients, starting IV's, and putting them on the table with the correct coil/antennae combination. This facility has a newer GE 1.5T 450.

Week 7 went very good. Spent approximately 35 hrs in MR. Limited time scanning, however, I am getting very comfortable with gaining IV access, screening patients, and rooming/tableing them. I can turn over the table also. Larry

Applications came in on Friday to work with the Techs on the changes. I also spent some time with the GE Field Engineer going over some of the back room equipment.

I participated in approximately 50 cases. I hope to get in some major scanning time over the next two weeks. I will concentrate on routine brain, breast, and extremity cases. I have not comp't any exams yet, so there is lot of work to be done between now and mid June.

GE Applications will be at my site in mid April, so I hope to get in on some of that training. I feel comfortable with patient care, IV access, power injection and hand injection of Gad, and turning over the room for different exams. Now, I just need some consistent scanning time. The site I work at is busy, so I have to work-in my scanning time as best I can

Additionally, I received 1.5 hrs of Breast Biopsy training from Hologic. We learned how to set up the room equipment, Bx tray, Bx machine, and plan of attack. We used a roast stuffed with several olives as a phantom. Fun stuff!

Observed, practiced and comp't a couple QA procedures. Spent time with the GE Field Engineer going over some of the computer room equipment.

I am feeling much more comfortable with the respiratory gating. There is certainly a difference between knowing what resp gating does and understanding how to get the machine to do what you want!

Certainly more learning this week! Still not overwhelmed with “new” scans. There was a difficult patient that required repeat-I was able to see the benefit / cost of using the fast “ 3minute brain” scan parameters. I was also able to see a hand MRI this week, this is one of the few new things I have been able to see. It was a terrible infection post animal bite.

This week I was able to spend some time with Becky the lead mammography tech. She showed me the mammography equipment and how to perform a basic mammogram. She showed me the different compression paddles and described how and when to use each one. She described correct patient positioning for each view, which for a screening study would be 2 different views for each breast.

This week I spent more time in mammography learning the equipment. I was able to observe about 5 more exams, one of which was on a patient that had breast implants. I saw how challenging these exams can be. Not only is it typically more painful, but there are four additional views required.

I'm very glad I made it through this term. It was very challenging, but all is well.