

The Instructional Program Review Narrative Report-Radiologic Science Program

1. College: Merritt

Discipline, Department or Program: Radiologic Science

Date: 2-9-10

Members of the Instructional Program Review Team: Jennifer Yates, Program Director; Jacqueline Custard, Clinical Coordinator; Jerry Hollister, Program Faculty

2. Narrative Description of the Discipline, Department or Program:

Please provide a general statement of primary goals and objectives of the discipline, department or program. Include any unique characteristics, degrees and certificates the program or department currently offers, concerns or trends affecting the discipline, department or program, and any significant changes or needs anticipated in the next three years.

Mission Statement

The purpose of the Radiologic Science Program at Merritt College is to prepare qualified practitioners to practice the art and science of diagnostic imaging. The goals of the program are to:

1. Prepare students to be proficient in the essential aspects of medical imaging while meeting the needs of the health care workforce.
2. Develop skills in team building, critical thinking and effective communication.
3. Encourage appropriate attitudes and foster affective growth in providing care and responding to patients' needs during imaging procedures.
4. Promote professional growth and life-long learning.

Radiologic Science Program Student Learning Outcomes

Upon completion of the program graduates will be able to:

1. Produce diagnostic quality medical images in a competent, safe, and compassionate manner for all basic radiography examinations in a hospital work environment.
2. Communicate effectively with patients by taking appropriate histories, giving clear instructions, and providing information as needed.
3. Exercise critical thinking and problem solving skills by adapting radiologic procedures to individual patient needs and conditions

4. Establish and maintain satisfactory professional relationships with other members of the health care team.
5. Function as an effective health care team member by providing services in a manner that complements those performed by other team members.

The Radiologic Science program has produced qualified radiologic technologists to meet the workforce needs of hospitals and outpatient imaging centers throughout the Bay Area for approximately fifty years. Most East Bay hospital facilities are staffed with at least several graduates of our program, in many departments the majority of technologists are Merritt graduates. As baby boomers age, the demand for qualified health care workers is increasing. The program is operating at maximum capacity for the existing staffing, space, and equipment. The projected need for technologists in the coming years ensures that the program will continue to serve the needs of the community. The program offers an education with significant earning potential for graduates in addition to providing for the staffing needs of Bay Area health care institutions.

Hospital affiliate sites have now completely transitioned to digital imaging. At this point, the program's physics laboratory equipment, already about 30 years old, is obsolete. The purchase of new energized equipment (capable of making x-ray exposures) with digital conversion, display, storage, and transmission capabilities are necessary to bring the program into the 21st century and provide the students with the skills needed for success in a modern imaging department. Most needed are: One energized radiography/fluoroscopy unit for Physics, one energized radiography-only unit for Physics, an additional teaching unit for Positioning (non-energized), laboratory phantoms (practice "dummies" made with human-like structures that may be x-rayed and imaged similarly to human anatomy). Major classroom renovations will be necessary to accommodate new equipment and technology.

3. Curriculum:

1. Is the curriculum current and effective? Have course outlines been updated within the last three years? If not, what plans are in place to remedy this?

Group met at several Staff Development workshops over the past year to write course SLO's together. Course outlines are updated on a revolving cycle-see below. The course syllabus and SLO's are collaboratively reviewed and updated each year they are taught.

2. Has your department conducted a curriculum review of course outlines? If not, what are the plans to remedy this?

Didactic faculty met on 2-3-10 and reviewed and updated courses taught during the current semester, including Radiographic Physics II, Advanced Imaging, Quality Management, Positioning II, Sectional Anatomy/Pathology, and Survey of Radiologic Science. The group decided to adapt the student learning outcomes from Positioning I for Positioning II since the courses are sequenced. SLO's for the Survey, Quality Management, and Advanced Imaging courses were approved as is. We identified that

SLOs had not yet been written for Sectional Anatomy/Pathology; we will write them together at our next staff meeting scheduled for February 22nd. We will continue to work in partnership during department meetings to refine and update SLOs and course outlines for the current semester, every semester.

3. What are the department's plans for curriculum improvement (i.e., courses to be developed, updated, enhanced, or deactivated)? Have prerequisites, co-requisites, and advisories been validated? Is the date of validation on the course outline?

We are concentrating on updating all curriculum to reflect digital radiography technology by attending seminars and conferences. Program prerequisites were last validated by the Merritt College Curriculum Committee March 3, 2009.

4. What steps has the department taken to incorporate student learning outcomes in the curriculum? Are outcomes set for each course? If not, which courses do not have outcomes?

Student Learning Outcomes have been written for about 90% of program courses. Faculty are continuously working on updating all course outlines, including the SLO's and assessment methods on Curricunet. At our recent curriculum review meeting on 2-3-10, we identified the next course we will write SLO's for: Sectional Imaging and Pathology. The group will work on this collaboratively at our next faculty meeting scheduled for February 22nd.

5. Describe the efforts to develop outcomes at the program level. In which ways do these outcomes align with the institutional outcomes?

Radiologic Science Program outcomes were written collaboratively with faculty and the program's Advisory Committee (see Section 2 for Program Outcomes). Outcomes are reviewed and revised as needed on an annual basis at the Spring Program Advisory Committee meeting every March. Program outcomes align most closely with the Communication and Critical Thinking Institutional Learning Outcomes.

6. Recommendations and priorities.

- Purchase updated X-ray equipment
- Complete writing SLO's for every program course
- Continue cyclic review of curriculum (Program Advisory Committee and Faculty), program course outlines (Faculty), program SLO's (Program Advisory Committee and Faculty), course SLO's (Faculty), and assessment tools (Faculty)

4. Instruction:

1. Describe effective and innovative strategies used by faculty to involve students in the learning process. How has new technology been used by the department to improve student learning?

For the Quality Management course, Custard has students take a leadership styles quiz online which reflects the kind of healthcare manager they will become. They then research and choose a leader who reflects their style and utilize youtube.com to download a theme song which when heard functions as a refocusing tool.

For the Introduction to Radiological Science course, Hollister has the students break into small groups (2-3 students) and they begin to address radiological concepts by openly discussing what they already know about the subject matter. The students next utilize their textbooks and internet resources to fill in missing information adding clarity for any insufficiencies.

For the Physics II course, Yates has students work collaboratively to design a laboratory experiment. The experiment demonstrates how an influencing factor affects a radiographic quality factor (e.g., how angling the tube creates shape distortion on a radiograph). Students bring in objects from home and develop the lab by making exposures to test their theories. When they have perfected the experiment, they write up the instructions and facilitate the laboratory activity with their classmates. This learning activity helps students learn to collaborate, understand how influencing factors work in radiography, and learn the importance of clear oral and written communications.

1. How does the department maintain the integrity and consistency of academic standards within the discipline?

- Faculty use a collaborative process for problem-solving when our assessment tools are not effective.
- Faculty discuss all student disciplinary actions, consensus is sought prior to taking action.
- Faculty make “Best Practice” visits to other community colleges with Radiologic Science Programs.
- Faculty keep current with technology through clinical hospital visits and by attending professional meetings and seminars, etc.

The program administers a Graduate Exit Survey, Alumni Survey, Employer Survey, and Radiologist Survey online using Survey Monkey. These surveys are an important part of the program’s yearly assessment cycle. Results are reviewed by faculty and Program Advisory Committee, actionable items are discussed and approved collaboratively.

2. Discuss the enrollment trends of your department. What is the student demand for specific courses? How do you know? What do you think are the salient trends affecting enrollments?

The program is in great demand: we typically receive approximately 150 applications per year for 30 slots in each beginning class. Our class size is limited by the number of clinical placements available at our hospital affiliates. At this point in time the program works with a wait list. Qualified applicants are waiting two years between application and program entry.

Enrollment Data

Baseline Data	Annual FTES	%FTES Growth	FTEF in Program	FTES/FTEF	comments
2008/09	N/A	N/A	N/A	N/A	
2007/08	112.83	3%	4.31	13.16	
2006/07	109.89	-5%	4.09	13.47	
2005/06	115.12	N/A	3.67	15.83	

Radiologic Technology	2004	2005	2006	2007	2008	CODE	Comments
Quantitative Assessments (Fall to Fall)							
1. Enrollment (CW1)	317	341	302	295	N/A		
2. Sections (master sections)	10	10	10	10	N/A		
3. FTEF	3.57	3.19	3.86	4.05	N/A		
4. FTES	46.57	54.17	53.72	57.32	N/A		
5. Productivity (FTES/FTEF)	13.05	16.98	13.92	14.15	N/A		

3. Are courses scheduled in a manner that meets student needs and demand? How do you know?

Although there is some demand for an evening program, patient load and variety of radiologic examinations available at the clinical sites is highest during daytime hours. It would be difficult for students to complete all of their clinical objectives in an evening program, as many of the exams they need to experience and achieve competency in are not scheduled in the evening.

4. Recommendations and priorities:

- Continue to explore innovative ideas for encouraging collaboration and critical thinking among students and faculty
- Continue to explore new ways to utilize technology as a learning tool
- Purchase new digital x-ray equipment and phantoms, so that students can safely experiment and learn in the x-ray laboratory

5. Student Success:

1. Describe student retention and program completion (degrees, certificates, persistence Rates) trends in the department. What initiatives can the department take to improve retention and completion rates?

Student Retention for *Program* Students (excludes students taking the prerequisite course “Survey of Radiologic Science”)

2004-2005	66% completion
2005-2006	76% completion
2006-2007	70% completion
2007-2008	73% completion
2008-2009	75% completion

Program completion rates are on an increasing trend, possibly as a result of support for students provided by the program, e.g. peer tutoring, and greater efforts by faculty to engage students in their own learning. Another possible reason is that students are waiting 2 years between application and entry; those who persist through the waiting period may demonstrate a higher level of commitment.

2. What are the key needs of students that affect their learning? What services are needed for these students to improve their learning? Describe the department’s efforts to access these services. What are your department’s instructional support needs?

Students need support through quality instruction, peer tutoring, access to equipment for hands-on practice, and clinical placements for practical experience at the worksite. All of these needs are provided by the program. The program also provides orientation through the Survey class-a prerequisite for the program, and through an all-day program orientation scheduled prior to the first day of classes.

The college offers programs that assist students with financial needs and special physical, emotional, and cognitive needs such as DSPS. Computer labs provide access to word processing, e-mail, and the internet for students who do not own a

home computer. The Merritt College library houses hard copy program texts on reserve and in general circulation, as well as electronic databases available from both on and off campus.

3. Describe the department's effort to assess student learning at the course level. Describe the efforts to assess student learning at the program level. In which ways has the department used student learning assessment results for improvement?

Course Level Assessment: Program faculty collaboratively examined assessment tools used by each instructor at our faculty meeting 2/9/10. Yates presented the final exam given in Patient Care II. She asked for assistance in fine-tuning the rubric used for grading the exam. Custard presented an assignment given in the Quality Management and Fluoroscopy course. Hollister requested input in revising his oral presentation assignment given in the Sectional Anatomy and Pathology course. Faculty made adjustments in assignments and scoring guides in response to feedback by the group.

Program Level Assessment: The program administers a Graduate Exit Survey, Alumni Survey, Employer Survey, and Radiologist Survey online using Survey Monkey. These surveys are an important part of the program's yearly assessment cycle. Results are reviewed by faculty and the Program's Advisory Committee, actionable items are discussed and approved collaboratively.

4. Recommendations and priorities:
 - Continue to support students by providing hands-on learning opportunities, assigning collaborative projects, providing peer-tutors and open lab times for extra practice. Refer students to resources provided by the college and district as appropriate.

6. Human and Physical Resources (including equipment and facilities)

Describe your current level of staff, including full-time and part-time faculty, classified staff, and other categories of employment.

1. Human Resources

At least 4.0 faculty are necessary to operate the program with no additional offerings of continuing education or elective courses. The program is currently operating with three full-time and two part-time faculty. Approval for hiring a fourth faculty position would allow for expansion of course offerings.

The program shares a support staff person with four other Allied Health programs. A part time support person dedicated to the Radiologic Science program could assist with program assessment tasks and overseeing contracts with affiliate hospitals.

The program receives approximately 150 applications each year. Review of application materials and transcripts of program applicants is an extremely time-consuming process necessitating an additional part-time classified staff person to serve as an evaluator during the program application period. The Radiologic Science Program Application Evaluator conducts scheduled Permit to Apply group sessions and assist students in the application process.

In support of larger classes and to decrease attrition rates, the program hires student peer tutor-mentors on a yearly basis. Peer tutor-mentors ensure that students receive the extra tutoring needed for success in program courses, in addition to the mentoring that assists students in their emotional adjustment to the college and clinical environments. Student tutors also provide additional supervision necessary in laboratory courses to ensure safe equipment handling and proper treatment of student “patients.”

2. Describe your current utilization of facilities and equipment.

Physical Resources

The Merritt College Radiologic Science Program utilizes a variety of teaching and learning resources. Auditory, visual, and kinesthetic learners benefit from the wide range of resources and methods utilized by the instructors in the didactic environment. Two large classrooms, capable of holding up to 40 students at a time, are used for many types of didactic learning including lecture-style presentations, group discussions, projects, and equipment demonstration. The existing furniture present in the classrooms consist of molded plastic chairs with attached desks. This furniture is uncomfortable (particularly for large people) and difficult to reconfigure for different types of learning experiences. New furniture purchases would make students more comfortable and assist in the learning process.

Both classrooms are wired for internet access. The campus area has wireless internet accessibility. Laptop computers and LCD projectors are provided to faculty for Power Point and other multi-media presentations. Each classroom is also equipped with its own conventional VCR and monitor, whiteboard, conventional overhead projector, and a large portable bank of view boxes. VHS tapes, DVD's and CDs are available to enhance learning. Evolve Select™ online course modules are available to students to enhance the classroom experience.

Each instructor maintains extensive teaching files of both hard copy and softcopy radiographs along with other graphic images for illustration of principles and concepts of subject areas taught. These files are continuously updated and expanded.

Each classroom houses one energized laboratory capable of radiographic and fluoroscopic exposures for physics instruction and laboratories. However, this equipment is approximately 30 years old and does not reflect current technology present in the hospital education facilities. A grant from a clinical affiliate provided the program with two new demonstration tables, upright wall assemblies, and digital control panels for positioning demonstration and practice (these units do not produce x-rays and are only useful for Positioning, not Physics). Two energized portable radiographic units, a fluoroscopic C-Arm unit, and one non-energized mammographic

unit is available for positioning practice. Located across the hall from the energized laboratories is a Quality Management area with an adjoining darkroom. The darkroom is large enough to accommodate 16 students at a time for demonstrations and includes an automatic processor.

The program has a variety of radiographic and fluoroscopic testing equipment for Physics and Quality Management laboratory classes. A full-body skeletal phantom, several part phantoms and skeletons are used for Positioning and Physics laboratories. Equipment used for Patient Care classes includes vital signs monitoring equipment, contrast media supplies, Standard Precautions personal protective attire, 2 wheelchairs and a gurney. An IV simulation arm capable of “blood” return is available for venipuncture instruction. Positioning equipment includes gonad and full apron shields, various size film/screen and computed radiography cassettes, sponges, and other positioning aids.

All equipment is available for use by students in the classrooms with an instructor present. Some equipment is also available for students to sign out and use independently at home or at their clinical site.

3. Are the human and physical resources, including equipment and location, adequate for all the courses offered by your department (or program)? What are your key staffing and facilities needs for the next three years? Why?

The program’s highest priority need at this time is for a new energized digital radiography and fluoroscopy laboratory at the college that reflects current technology in use at the hospital clinical sites. A dedicated radiography computer lab with a Picture Archiving and Communications System is also needed to provide students with learning experiences critical for success in the practice of the profession. The program director has applied for Measure A funds to purchase equipment for the new lab.

4. Recommendations and priorities.
 - Purchase equipment for new energized radiography and fluoroscopy lab at the college
 - Continue to hire an evaluator to assist students during the application period for the program
 - Continue to hire student tutors/mentors to assist classmates in the radiography classroom and laboratory
 - Explore hiring an additional part time clinical instructor to fill the position left vacant by Natalie Camozzi’s departure
 - Continue to update equipment and teaching materials as needed in response to changes in the industry

7. Community Outreach and Articulation

For vocational programs:

1. Describe the department's connection with industry. Is there an Advisory Board or Advisory Committee for the program? If so, how often does it meet? Is the program adequately preparing students for careers in the field? How do you know?

The program is blessed with an active and vocal advisory committee comprised of student representatives, college faculty, clinical instructors, and managers from the program's hospital affiliates. The advisory committee meets once during Fall and Spring Semesters. The role of the advisory committee is to review program level outcomes and curriculum, making recommendations for changes based on industry standards. The advisory committee also reviews program assessment data including results of the Graduate Exit Survey, Alumni Survey, Employer Survey, and Radiologist Survey. Actionable items are discussed, and the group uses a process of collaborative problem solving to decide on next steps. The Advisory Committee also serves to alert the program of changes in hospital accreditation requirements and policy changes.

2. Have students completing the program attained a foundation of technical and career skills? How do you know? What are the completion rates in your program?

Students completing our program have attained a strong foundation of technical and career skills. We know this based on the results of our Alumni Surveys, Employer Surveys, and Radiologist Surveys; also based on our ARRT exam completion rates (100% for the past 4 years) and job placement rate (average of 98% over the past 4 years). See 5.1 for the program completion rates for the past 5 years. The majority of employers and radiologists indicate that they are "Very Satisfied" or "Satisfied" with our graduates (based on survey item responses for the past 4 years for the Employer Survey and 2 years for the Radiologist Survey), and that our graduates are superior to graduates of other programs. The majority of program alumni indicate that they are "Very Satisfied" or "Satisfied" with the program and would recommend it to a family member or friend (based on survey item responses for the past 4 years).

3. What are the employment placement rates? Include a description of job titles and salaries. What is the relationship between completion rates and employment rates?

Employment rates have averaged 98% over the past 4 years based on respondents to our Alumni Survey administered online yearly 6 months following graduation with each class. Starting salaries reported by the graduating class of 2008 (data most recently available) averaged \$37.42 per hour. Graduates reported gaining employment from two weeks to 7 months following program completion (Graduates must pass the ARRT exam and receive their state certificate before they can practice.

This process takes about 2 months following program completion). Starting titles included Radiologic Technologist and CT Technologist.

4. What industry trends are most critical for the future viability of the program? How do you know? What are the implications of these trends for curriculum development and improvement?

Rapid advancements in technology drive the industry and serve as the primary challenge for the program as we struggle to keep up in the current economic climate. Partnerships with hospital affiliates for clinical education assist the program in providing students with quality hand-on learning experiences with the most up-to-date equipment possible. Program faculty keep current by participating in clinical practice, reading journals, and attending conferences and seminars.

Please see US Dept. of Labor, Bureau of Labor Statistics-Tomorrow's Jobs (may be found at: <http://www.bls.gov/oco/oco2003.htm>)

State labor statistics project that Healthcare jobs are expected to grow more than any other occupation in the next decade.

Local evidence: Program Advisory Committee-Discussion with industry representative at 10/1/09 Advisory Committee meeting indicates that although there is no longer a critical shortage of radiologic technologists, area healthcare facilities are hiring graduates of the class of 2009.