Montgomery County Community College
RAD 113
Principles of Digital Imaging
3-2-2

COURSE DESCRIPTION:
This course focuses specifically on the components, principles and operation of digital imaging systems. Factors that impact image acquisition, display, archiving and retrieval are discussed. Quality control and continuous quality management will also be presented.

REQUISITES:
Previous Course Requirements
- RAD 100 Introduction to Radiography and Patient Care
- RAD 102 Radiographic Exposure and Technique
- RAD 104 Clinical Education I
- RAD 111 Radiographic Procedures I

Previous or Concurrent Course Requirements
- RAD 105 Radiation Physics
- RAD 121 Radiographic Procedures II
- RAD 114 Clinical Education II

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Explain the basic principles of Digital Imaging Acquisition.	Lecture/Discussion Demonstration/Practice Lab Experiments with Documentation Assigned Readings Practical Applications	Examination Technique Labs Questions and Discussion
2. Discuss the types of detectors used in digital imaging.	Lecture/Discussion Demonstration/Practice Lab Experiments with Documentation Assigned Readings Practical Applications	Examination Technique Labs Questions and Discussion

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
3. Explain the effect of different digital imaging detectors on patient dose.	Lecture/Discussion Demonstration/Practice Lab Experiments with Documentation Image Analysis Oral Presentations Assigned Readings Practical Applications	Image Evaluation Rubrics Technique Labs Examination Questions and Discussion
4. Discuss how exposure index factors should be utilized by radiographers.	Lecture/Discussion Demonstration/Practice Lab Experiments with Documentation Assigned Readings Practical Applications	Examination Technique Labs Questions and Discussion
5. List the pre-processing and post-processing steps for digital imaging systems.	Lecture/Discussion Case Study Lab Experiments with Documentation Oral Presentations Assigned Readings Practical Applications	Examination Questions and Discussion QM Project
6. Identify strategies to correct Image Acquisition Errors.	Lecture/Discussion Demonstration/Practice Lab Experiments with Documentation Case Study Oral Presentations Assigned Readings Practical Applications	Examination Technique Labs Questions and Discussion
7. Evaluate digital images for diagnostic quality.	Lecture/Discussion Demonstration/Practice Lab Experiments with Documentation Case Study Oral Presentations Assigned Readings Practical Applications	Examination Technique Labs Questions and Discussion
8. Explain the Quality Assurance Testing for all aspects of a Digital Imaging System and Picture Archiving and Communication Systems (PACS).	Lecture/Discussion Assigned Readings Practical Applications Discussion of Lab experiment findings	Examination Technique Labs Group Presentations Questions and Discussion

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
9. Depict different configurations of data management communication and retrieval in the radiology department and beyond.	Lecture/Discussion Assigned Readings Practical Applications	Examination Questions and Discussion

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

SEQUENCE OF TOPICS:

1. Introduction to Digital Imaging and PACS
2. Basic Principles of Digital Imaging
3. Digital Radiographic Image Processing and Manipulation
4. Digital Imaging Acquisition
5. PACS
6. Basic Computer Principles in PACS
7. PACS Archiving and Peripherals
8. Quality Control and Management with Digital Imaging and PACS
9. Ensuring Quality in PACS Systems

LEARNING MATERIALS:

Texts*:*

Carroll, Quinn, B. (2018). *Radiography in the Digital Age* (3rd Edition).Springfield, IL: Charles C. Thomas Publisher

Carroll, Quinn, B. (2018). *Student Workbook for Radiography in the Digital Age* (3rd Edition).Springfield, IL: Charles C. Thomas Publisher

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by: Cheryl L. DiLanzo, M.S.,R.T. Date: 11/1/2016

VPAA/Provost or designee Compliance Verification: Date: 2/2017

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.