

### Request for Undergraduate Course Addition

Prepare one paper copy with all signatures and forward to the University Curriculum Committee Chair. Additionally, immediately following attainment of the College Curriculum Chair signature, send one identical ELECTRONIC COPY sans signatures in PDF format with all supporting documentation converted to PDF format by email to the University Curriculum Committee chair for electronic distribution.

College: COHP Department/Division: Medical Imaging Alpha Designator / Number : MI 309 Graded:  CR/NC:

Contact Person: Dr. Shelia Kyle, Vice President Phone: 304-526-1412  
St. Mary's Center for Education

Dr. Rita Fisher 304-526-1259  
Director – School of Medical Imaging

**NEW COURSE DATA:**

New Course Title: Digital Image Acquisition and Display

Alpha Designation/Number:

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Title Abbreviation:

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(Limit of 25 characters and spaces.)

Course Description (Limit of 30 words): Content is designed to impart an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiography.

Co-requisite(s): MI 307, MI 308, MI 309, MI 310 First Term to be offered: Spring 2010

Prerequisite(s): MI 303 Admission to the Medical Imaging Program Credit Hours: 2

Course(s) being deleted in place of this addition (must submit course deletion form): None

**CHECKLIST/REQUIREMENTS:**

1. After completing this two page form in its entirety, include a complete syllabus and route through the departments/committees below.
2. A complete syllabus can be from when this course was previously taught as a special topics course or by creating a new, intended syllabus to use with the course. The sample syllabus must at a minimum address the following areas:
  - a. COURSE OBJECTIVES
  - b. COURSE OUTLINE
  - c. SAMPLE TEXT(S) WITH AUTHOR(S) AND PUBLICATION DATE
  - d. INSTRUCTIONAL METHODS (Lecture, Lab, Internship, Practicum, etc...)
  - e. EVALUATION METHODS (Unit/Chapter, Midterm, Final, Projects, etc...)
3. If this course will replace a course that is required by another department, please send a memo to the affected department and include it with this packet, as well as, the response received from the affected department.
4. If this course will be similar in title or content to another department's courses, please send a memo to the affected department and include it with this packet, as well as, the response received from the affected department.
5. Send a copy of this completed form to the Marshall University Catalog Editor.

SIGNATURES: (If disapproved at any level, do not sign. Return to previous signer.)

Department Chair/Division Head _____	Date: _____
Registrar: _____	Date: _____
Librarian: _____	Date: _____
College Dean: _____	Date: _____
College Curriculum Chair _____	Date: _____
University Curriculum Committee Chair: _____	Date: _____
Faculty Senate Chair: _____	Date: _____
VP Academic Affairs/VP Health Services: _____	Date: _____

**Request for Undergraduate Course Addition - Page 2**  
**Additional Information Required for Undergraduate Course Addition**

College: COHP

Department/Division: Medical Imaging

Alpha Designator/Number: MI 309

Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

1. Identify by name the faculty in your department/division who may teach this course.

Rita Fisher, PhD RT (R)(CT)(CV)(ARRT), Karen Foster RBA RT (R)(ARRT)

2. If your department/division requires additional faculty, equipment, or specialized materials, attach an estimation of money and time required to secure these items.

No additional funding required

3. If this course will be required by a department/division other than your own, identify by name.

N/A

4. If there are any agreements required to provide clinical experience, attach details and signed agreements.

No additional agreements will be needed for this class

5. If library resources are deemed inadequate, attach a plan to overcome this. The plan must include the cost as stated by the Dean of Libraries.

No additional Library Resources to be provided by Marshall University

6. EQUIPMENT/SUPPLIES NEEDED TO TEACH THIS COURSE (this does not refer to additional equipment/supplies that need to be purchased; simply what materials are needed in order to teach this course successfully.):

Computer, LCD Projector, Projector Screen, White Board, Markers, Handouts, CD Rom's

No additional equipment or supplies will need to be provided by Marshall University

7. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE OR GRADUATE COURSE (please also submit to Graduate Council course addition for 5xx graduate component):

None

8. PROVIDE A COMPLETE BIBLIOGRAPHY INCLUDING ALL PUBLICATIONS RESEARCHED TO CREATE THIS COURSE AND WHAT PUBLICATIONS MAY BE BENEFICIAL TO STUDENTS TAKING THIS COURSE (separate page).

See attached sheet

## **BIBLIOGRAPHY:**

Brennan P, Seeram E. *Digital Radiography*. Blackwell Publishing Professional, 2007  
ISBN 0632064714

Dreyer KJ, Mehta A, Thrall JH. *PACS – A Guide to the Digital Revolution*. New York: Springer; 2002.  
ISBN 0387952918

Huang, HK. *PACS and Imaging Informatics*. 2nd ed. Hoboken, NJ: Wiley-Liss; 2004.  
ISBN 0471251232

Oakley J. *Digital Imaging: A Primer for Radiographers, Radiologists and Health Care Professionals*. NY: Cambridge University Press; 2003.  
ISBN 9780521866194

Reiner BI, Siegel EL, Carrino JA. *Quality Assurance: Meeting the Challenge in the Digital Medical Enterprise*. Society for Computer Applications in Radiology (SCAR); 2002,  
ISBN 0970669321

Samei E, Flynn MJ, eds. *2003 Syllabus, Advances in Digital Radiography: Categorical Course in Diagnostic Radiology Physics*. Oak Brook, Ill: Radiological Society of North America; 2003.  
LC Control Number 2004275095

Seibert JA, Filipow L, Andriole K, eds. *Practical Digital Imaging and PACS*. College Park, Md: AAPM, Medical Physics Publishing; 1999.  
ISBN 0944838200

Shephard C. *Radiographic image production and manipulation*. New York: McGraw-Hill; 2002.  
ISBN 0071375775

Siegel EL, Kolodner RM, eds. *Filmless Radiology*. New York: Springer; 1999.  
ISBN 0387985158

## COURSE OUTLINE SYLLABUS

Course: MI 309 Digital Image Acquisition and Display

Semester and Year: Spring 2010

The textbook used will be *Principles of Radiographic Imaging*, 4<sup>th</sup> Edition, by Richard R. Carlton/Arlene M. Adler. All test material will be from the textbook, materials presented in class, instructor handouts and an interactive CD.

Computer Requirements: SMMC Computer Lab

Instructor: Rita Fisher, PhD, RT(R)(CT)(CV)(ARRT)

Karen Foster, RBA, RT(R)(ARRT)

Office: CFE, Rm 214

Office Hours: Wednesday, 2:30-3:30pm

Phone/email: (304)526-8224

[kfoster@st-marys.org](mailto:kfoster@st-marys.org)

**Course Description:** Content is designed to impart an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving and retrieval are discussed. Guidelines for selecting exposure factors and evaluating images within a digital system assist students to bridge between film-based and digital imaging systems. Principles of digital system quality assurance and maintenance are presented. This course will satisfy the Marshall Plan computing requirement. Lecture

**Credits:** 2CR HR

**Prerequisites:** MI 303

**Desired Learner Outcomes/Objectives:** When finished with this course student will be able to:

1. Identify various types of computers.
2. Define analog to digital conversion and digital signal processor.
3. Identify various terms related to computer fundamentals and components.
4. Identify all parts of the computer, input and output, and its function.
5. Describe computer care and preventive maintenance.
6. Distinguish between analog computers and digital computers.
7. Discuss application of various types of software.
8. Explain the following computing applications as they relate to radiology:
  - a. Radiologic information systems (RIS),
  - b. hospital information systems (HIS)
  - c. picture archiving communication systems (PACS).
9. Define digital imaging and communications in medicine (DICOM).
10. Discuss the impact the Internet has on the distribution of health information.

**Evaluation/Measurement/Assessment of Learner Outcomes:**

Course grade will be based on assignments, exams, quizzes and a final written exam:

Exams	70%
Assignments	5%
Quizzes	5%
Final	20%

Grades will be determined by the following scale:

92.3-100	A
84.3-92.2	B
74.3-84.2	C
Below 74.3	F

## Policy Statements:

1. **Attendance:** Regular attendance is expected. Students who miss more than two classes will receive a one letter drop in the final grade. You cannot pass the course with more than four absences. You must be present at the beginning of the class and stay until the end of class in order to be counted present. The School of Medical Imaging follows Marshall University inclement weather policy. Refer to the Student Handbook.
2. **Preparation, participation, punctuality.** All preparation material should be completed prior to its scheduled discussion in class. All class sessions will be conducted with the assumption that all appropriate readings and/or assignments have been completed. Doing the preparation work prior to class will allow you to identify specific topics with which you need the most help, and you can then raise the pertinent questions when the topic is scheduled for class time. Not all assigned information will be reviewed in class. Additionally, information that may not have been assigned may be reviewed in class. If you have a question about a particular subject, you have the responsibility of using class time to get your questions answered or make an appointment for individualized help. This necessitates having attempted the work prior to class. Class time should be used to clarify issues; it is difficult to know what issues you need to have clarified if you have not prepared.
3. **Academic integrity:** Please refer to the Student Handbook. Students may not copy or utilize prior exams as study material unless provided by the instructor for review. Students who obtain copies of old exams from current or former students will be sanctioned.
4. **Make-up assignments:** Unexcused late assignments will not be accepted (or will receive 50% credit). Students who miss scheduled exams may make them up only in the event of a medical emergency or by prior arrangement with the instructor.
5. **Missed classes:** If you are absent, it is your responsibility to find out from a classmate what notes, handouts, assignments, or other course material you missed and to make arrangements with me to receive handouts.
6. **Office hours:** Instructors are available to meet individually by appointment.
7. **Learning Disabled Students:** consideration toward learning disabled students will be in accordance to SMI Student Handbook policies. Please make certain the instructor is made aware of any special needs.
8. **Computing policy at SMMC:**
  1. Authorized users of SMMC or other clinical affiliates institutional networks are those individuals who have been granted a username and password. Unauthorized use of usernames or passwords is prohibited
  2. Use of computer systems in the clinical setting is limited to authorized patient data entry. Unauthorized access or attempts to access privileged patient information is a HIPAA violation and may result in dismissal from the SMI.
  3. Students are provided access to the Internet through computers located in the School of Nursing Library, the computer lab and the SMI office. **Internet access is limited to assigned research projects.** Students may not access personal e-mail accounts (such as Hotmail or Yahoo) from these computers. Non school related use of the internet is prohibited. Students may access the internet via computers located in the Mojo/vending area in the hospital.
  4. Internet access at SMMC is monitored by Information Services. Any attempts to download material of an obscene nature may result in dismissal from the SMI.
  5. Students have access to computers located in the computer lab next to the SMI classroom. Students may not store information of the hard drive of these computers.
  6. Users must adhere to the ethical standards governing copyright, software licensing, and intellectual property.
  7. Suspected violation of these guidelines constitutes unacceptable use of information resources, and may violate other institutional policies and/or state and federal law including HIPPA. Suspected or known violations should be reported to the appropriate supervisory authority. The SMI and/or law enforcement agencies will process violations.
  8. Violations may result in revocation of computing resource privileges, academic dishonest proceedings, disciplinary action or legal action.
  9. Violations are subject to the appeal or grievance process.
  10. Students should refer to SOMI computer policy in the CFE Student handbook

### Proposed Course Schedule.

Dates and content are subject to change as the semester progresses. Changes will be announced in class as far in advance as possible.

<i>Date</i>	<i>Reading Assignment/Exam</i>	<i>Homework/Due Date</i> <i>(additional TBA)</i>	
Jan 14	The Computer /Chapter 24	Chapter 24: Key Terms	Jan 28
Jan 21	Digital Image Acquisition , Digital Image Quality		
Jan 28	Lecture/Computer Lab 1		
Feb 4	Exam 1		
Feb 11	Historical Development, CR Plate Systems (PSP) / Chapter 25	Chapter 25: Key Terms	Feb. 25
Feb 18	CR Image Quality, Toleration of Overexposure		
Feb 25	Lecture/Computer Lab 2		
Feb 4	Exam 2		
Mar 11	Image Acquisition Elements, Direct Exposure Imaging System (Direct/Indirect)		
Mar 18	DICOM, Artifacts		
Mar 25	Lecture/Computer Lab 3		
Apr 1	Exam 3		
Apr 8	PACS, Image Acquisition, Image Distribution, /Chapter 26	Chapter 26: Key Terms	Apr 29
Apr 15	<b><i>Spring Break</i></b>		
Apr 22	Image Display, Storage		
Apr 29	Computer Lab 4		
May 6	Exam 4		
May 8	Final		