

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 303 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: Image Acquisition and Processing

Alpha Designation/Number:

| | | | | | | | | | |
|---|---|--|---|---|---|--|--|--|--|
| M | I | | 3 | 0 | 3 | | | | |
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Title Abbreviation:

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| I | M | A | G | E | | A | C | Q | U | I | S | I | T | I | O | N | | | | | | |
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(Limit of 25 characters and spaces.)

Course Description (Limit of 30 words): Introduces student to the factors that govern the image production process.

Co-requisite(s): MI 302, MI 303, MI 304, MI 305, MI 306 First Term to be offered: Fall 2009

Prerequisite(s): MTH 121 or higher, MI 209; Admission to the Medical Img Program Credit Hours: 3

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 303

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:

Adler A, Carlton R, Poelhuis DJ, Kowalczyk NK. *Workbook W/Lab Exercises for Principles of Radiographic Imaging*. 4th ed. Albany, NY: Delmar Thomson Learning; 2006.

ISBN 140187195X

Bushong S. *Mosby's Radiography Online: Radiographic Imaging*. 8th ed. St. Louis, Mo: Mosby; 2004.

ISBN-10: 0323032613

ISBN-13: 978-0323032612

Bushong S. *Radiologic Science for Technologists: Physics, Biology, and Protection*. 8th ed. St. Louis, Mo: Mosby; 2001.

ISBN 0323013376

Bushong S. *Radiologic Science for Technologists - Workbook and Laboratory Manual*. 8th ed. St. Louis, Mo: Mosby; 2004.

ISBN 0323025552

Ball JE, Price T, eds. *Chesneys' Radiographic Imaging*. 6th ed. Cambridge, Mass: Blackwell Scientific Publishers Inc; 1995.

ISBN 0632039019

Carlton R, Adler A. *Principles of Radiographic Imaging: An Art and a Science*. 4th ed. Albany, NY: Delmar Publishers; 2006.

ISBN 1401871941

Carroll Q. *Fuch's Radiographic Exposure, Processing, and Quality Control*. 7th ed. Springfield, IL: Charles C. Thomas; 2003.

ISBN 0398073732

DeVos DC. *Basic Principles of Radiographic Exposure*. 2nd ed. Baltimore, Md: Williams & Wilkins; 1995.

ISBN 0683024582

Erkonen WE, Smith WL. *Radiology 101: The Basics and Fundamentals of Imaging*. 2nd ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2005.

ISBN 0781781985

Fauber TL. *Radiographic Imaging & Exposure*. 2nd ed. St. Louis, Mo: Mosby; 2004.

ISBN-10: 0323025579

ISBN-13: 978-0323025577

Grainger RG. *Grainger & Allison's Diagnostic Radiology: A Textbook of Medical Imaging*. 3rd ed. New York, NY: Churchill Livingstone; 1997.

ISBN 0443051674

Haus AG, Jaskulski SM. *The Basics of Film Processing in Medical Imaging*. Madison, Wis: Medical Physics Pub; 1997.

ISBN 0944838782

Haus AG. *Advances in Film Processing Systems Technology and Quality Control in Medical Imaging*. Madison, Wis: Medical Physics Pub Corp; 2001.

ISBN 1930524013

Juhl JH. *Paul & Juhl's Essentials of Radiologic Imaging*. 7th ed. Philadelphia, Pa: JB Lippincott Company; 1998.

ISBN 0397584210

COURSE SYLLABUS OUTLINE

Course: MI 303: Image Acquisition and Processing

Semester and Year: Fall 2009

Day and Time: Monday and Wednesday, 11:00am

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

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

Office: CFE, Rm 214

Office Hours: by appointment

Phone/email: (304)526-8224

kfoster@st-marys.org

Course Description: Content is designed to establish a knowledge base in factors that govern the image production process. Film imaging with related accessories is emphasized. The student will be able to experimentally alter image acquisition factors and evaluate the effects without unnecessary exposure to the patient.

Credits: 3 CR HR (2 hr lecture/ 1 hr lab)

Prerequisites: MTH 121, MI 210

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

1. Discuss, assess, and analyze the factors affecting the photographic and geometric properties of the image.
2. Summarize and evaluate factors affecting scattered and secondary radiation and its affect on the image.
3. Explain the use and benefits of standardized radiographic technique charts and how the charts are developed.
4. Explain exposure factor considerations involved in selecting techniques and the manipulation of mAs and kVp.
5. Discuss darkroom, processing, silvery recovery, and film storage requirements for radiographic film.
6. Apply conversion factors for changes in the following areas: distance, grid, image receptors, mAs reciprocity and 15 percent rule.
7. Describe the function of each component of radiographic film and its properties.
8. Discuss latent image formation, image receptors, holders and the selection of the most appropriate receptor for given clinical situations.
9. Discuss the function, maintenance, and clinical use of intensifying screens.
10. Identify types of image artifacts and analyze them to determine the cause.

Evaluation/Measurement/Assessment of Learner Outcomes:

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

| | |
|-------------------|------------|
| Lecture Exams(7) | 60% (65%)* |
| Homework /Quizzes | 10% (0%)* |
| Lab (7) | 15% (15%)* |
| Final | 15% (20%)* |

Grading Scale:

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

* (Grade % if no Homework/Quizzes are assigned)

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 MCTC computer policy in the MU 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>Topic</i> | <i>Assigned Reading</i> |
|--------------------|---|--------------------------|
| August 18 | Imaging; Standards | Chapter 27 |
| August 20 | Density; LAB 1 | Chapter 28, Chapter 11 |
| August 25 | Contrast | Chapter 29 |
| August 27 | Exam 1 | |
| Sept. 1 | Labor Day Holiday | |
| Sept. 3 | Imaging; Detail | Chapter 30 |
| Sept. 8 | Imaging; Distortion | Chapter 31 |
| Sept. 10 | Scatter and Secondary Radiation; LAB 2 | Chapter 12 |
| Sept. 15 | Scatter and Secondary Radiation | |
| Sept. 17 | Exam 2 | |
| Sept 22 | Beam Restriction | Chapter 15 |
| Sept. 24 | Beam Filtration; LAB 3 | p 156 & Chapter 10 |
| Sept. 29 | Grids | pgs.156 &206; Chapter 18 |
| Oct. 1 | Exam 3 | |
| Oct. 6 | Technique Charts | Chapters 34, 35, 36 |
| Oct. 8 | LAB 4 | |
| Oct. 13 | Exposure Calculations: Worksheet | Chapter 38 |
| Oct. 15 | Exam 4 | |
| Oct. 20 | Radiographic Film | Chapter 19 |
| Oct. 22 | Intensifying Screens; LAB 5 | Chapter 22 |
| Oct. 27 | Film/Screen Speed: | Chapter 23 |
| Oct. 29 | Exam 5 | |
| Nov. 3 | Automatic Processing | Chapter 20 |
| Nov. 5 | Chemistry; LAB 6 | Chapter 20 |
| Nov. 10 | Darkroom, Film Handling and Storage | Chapter 20 |
| Nov. 12 | Exam 6 | |
| Nov. 13- 15 | WVSRT (leave at 11:00am) | |
| Nov. 17 | Silver Recovery | Chapter 20 |
| Nov. 19 | Sensitometry | Chapter 21 |
| Nov. 24 | Sensitometry | |
| Nov. 26 | LAB 7 | |
| Nov. 27-28 | Thanksgiving | |
| Dec. 1 | Artifacts | p327 & Appendix B&C |
| Dec. 3 | Exam 7 | |
| Dec. 8 | Review | |
| Dec. 10 | Final | |
| Dec. 15 | Makeup if needed | |
| Dec. 17 | Winter Break, Return on January 12, 2009 | |