

# Washtenaw Community College Comprehensive Report

## MRI 160 MRI Advanced Imaging Procedures Effective Term: Fall 2015

### Course Cover

**Division:** Math, Science and Health

**Department:** Allied Health

**Discipline:** Magnetic Resonance Imaging

**Course Number:** 160

**Org Number:** 15600

**Full Course Title:** MRI Advanced Imaging Procedures

**Transcript Title:** MRI Advanced Imaging

**Is Consultation with other department(s) required:** No

**Publish in the Following:** College Catalog , Time Schedule , Web Page

**Reason for Submission:** New Course

#### **Change Information:**

**Rationale:** This is a required course for the Magnetic Resonance Imaging (MRI) program.

**Proposed Start Semester:** Spring/Summer 2016

**Course Description:** In this course, students learn advanced Magnetic Resonance Imaging (MRI) scanning procedures to date. Topics include breast MRI including dynamic contrast enhanced MR of the breast, cardiac MR including myocardial perfusion and cardiac stress MR, function and functional MR, MR enterography (MRE), colonography, molecular MR imaging and MR elastography.

### Course Credit Hours

**Variable hours:** No

**Credits:** 3

**Lecture Hours: Instructor:** 45 **Student:** 45

**Lab: Instructor:** 0 **Student:** 0

**Clinical: Instructor:** 0 **Student:** 0

**Total Contact Hours: Instructor:** 45 **Student:** 45

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

Audit

**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

### College-Level Reading and Writing

College-level Reading & Writing

### College-Level Math

#### Requisites

##### **Enrollment Restrictions**

Admission to the Magnetic Resonance Imaging (MRI) program.

##### **Corequisite**

MRI 165

### General Education

### Request Course Transfer

**Proposed For:**

## Student Learning Outcomes

1. Differentiate the protocols for the advanced Magnetic Resonance Imaging (MRI) scanning procedures.

### **Assessment 1**

**Assessment Tool:** Departmental final exam

**Assessment Date:** Spring/Summer 2019

**Assessment Cycle:** Every Three Years

**Course section(s)/other population:** All sections

**Number students to be assessed:** All students

**How the assessment will be scored:** answer key

**Standard of success to be used for this assessment:** 80% of the students will score 70% or higher on each related outcome question.

**Who will score and analyze the data:** Departmental Faculty

2. Identify the clinical indications and contraindications for the advanced Magnetic Resonance Imaging (MRI) scanning procedures.

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## Course Objectives

1. Determine normal cardiac anatomy including 2, 3, and 4 chamber views, left ventricular outflow tract, right ventricular outflow tract, and short axis images.  
**Matched Outcomes**
2. Recognize normal and abnormal anatomy on MRI imaging of the myocardium, including scars and tumors.  
**Matched Outcomes**
3. Describe how breast magnetic resonance (MR) is performed including, dynamic breast imaging and MR breast biopsy.  
**Matched Outcomes**
4. Explain molecular imaging and the difference between perfusion and arterial spin labeling.  
**Matched Outcomes**
5. Explain the patient preparation and scanning procedure used for both magnetic resonance enterography(MRE) and colongraphy.  
**Matched Outcomes**
6. Explain the concepts related to magnetic resonance MR elastography including why, and how it is used in the clinical setting.  
**Matched Outcomes**
7. Discuss the role of Magnetic Resonance Imaging (MRI) in detection of cardiac insult, tumor and determination of cardiac viability.  
**Matched Outcomes**
8. Specify the scan slice placement used to produce images of the chambers, outflow tracts, pulmonary vessels, great vessels, and valves of the heart.  
**Matched Outcomes**
9. Discuss the role of MRI in detecting breast cancers for BRCA1 and BRCA2 positive patients.  
**Matched Outcomes**
10. Explain uptake and washout curves and the role of computer-aided detection of breast cancers.  
**Matched Outcomes**

11. Discuss the principles of molecular imaging for clinical and research magnetic resonance imaging (MRI).  
**Matched Outcomes**
12. Discuss the role of magnetic resonance (MR) enterography in detecting and staging of small and large bowel pathologic processes.  
**Matched Outcomes**
13. Discuss patient care issues and list preparations for all advanced MR procedures.  
**Matched Outcomes**
14. Explain magnetic resonance (MR) spectrography and Hunter's angle.  
**Matched Outcomes**
15. Discuss functional magnetic resonance (MR) with activation maps and identify the various functional areas of the brain.  
**Matched Outcomes**
16. Discuss the concepts behind magnetic resonance (MR) elastography as it relates to liver imaging for cirrhosis and the new application in brain imaging.  
**Matched Outcomes**
17. Compare and contrast the advantages and disadvantages of the advanced Magnetic Resonance Imaging (MRI) scanning procedures.  
**Matched Outcomes**
18. Evaluate efficacy of advanced Magnetic Resonance Imaging (MRI) scanning procedures.  
**Matched Outcomes**
19. Discuss the role of advanced Magnetic resonance Imaging (MRI) scanning procedures in patient care.  
**Matched Outcomes**
20. Discuss the benefits and potential limitations of current advanced Magnetic Resonance Imaging (MRI) scanning procedures.  
**Matched Outcomes**

## **New Resources for Course**

### **Course Textbooks/Resources**

#### Textbooks

Westbrook, C., Roth C., & Talbot, J. *MRI in Practice*, 4 ed. Wiley-Blackwell, 2011, ISBN: 9781444337433.

#### Manuals

#### Periodicals

#### Software

### **Equipment/Facilities**

Level III classroom

Other: OE 121 Radiography lab will be used.

| <b><u>Reviewer</u></b>  | <b><u>Action</u></b>      | <b><u>Date</u></b>  |
|---|---------------------------|---------------------|
| <b>Faculty Preparer:</b><br><i>Connie Foster</i>                | <i>Faculty Preparer</i>   | <i>Nov 18, 2014</i> |
| <b>Department Chair/Area Director:</b><br><i>Connie Foster</i>  | <i>Recommend Approval</i> | <i>Nov 18, 2014</i> |
| <b>Dean:</b><br><i>Kristin Brandemuehl</i>                      | <i>Recommend Approval</i> | <i>Nov 19, 2014</i> |
| <b>Vice President for Instruction:</b><br><i>Bill Abernethy</i> | <i>Approve</i>            | <i>Jan 05, 2015</i> |