



## MASTER COURSE OUTLINE

A. RADT 2312 Magnetic Resonance Imaging (MRI)

B. COURSE DESCRIPTION:

This course introduces the student to common magnetic resonance (MR) procedures, basic fundamentals of MR physics, and patient care and safety during magnetic resonance (MR) exams. Specific positioning procedures of the following are covered: head, neck, spine, thorax, abdomen, pelvis, and musculoskeletal. Anatomical structures and pathology are discussed. The history of MR will be included in the course. The course will explore the function of the hardware components of the magnetic resonance computer system, equipment, instrumentation, sequence parameters and options, data acquisition and image processing. Screening measures are discussed for patients, equipment and the MR environment. This course covers the importance of legal and ethical responsibilities as an imaging professional, patient right, patient and personnel education, interpersonal communications, and MRI screening and safety. Patient assessment, monitoring and management of medical emergencies are discussed. Venipuncture, contrast media, infection control, and informed consent are reviewed. Prerequisites: RADT 2215, 2283 or registered Radiologic Technologist. This course is part of the Radiography program which is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT).

**(2 Cr – 2 lect, 0 lab)**

C. \*\* Core Theme: Ethical and Civic Responsibility

D. RIVERLAND INSTITUTIONAL LEARNING OUTCOMES:

This course addresses the following Riverland Institutional Learning Outcome(s):

- ILO 1: critical thinking (*Core Theme Goal 2*)
- ILO 2: awareness of the larger global community (*Core Theme Goal 7 or Goal 8*)
- ILO 3: ethical, engaged citizenship (*Core Theme Goal 9 or Goal 10*)
- ILO 4: communication and collaboration (*Discipline Goal 1 and by any learning outcome(s) involving communication or collaboration*)

E. MAJOR CONTENT AREAS:

- Common MR exams
- Anatomical structures and pathology
- Patient care and communication skills
- Patient and personnel screening
- Legal and ethical responsibilities
- Protocols, venipuncture, contrast media and informed consent
- Patient positioning criteria
- Imaging planes

- Image artifacts
- Case studies
- History of magnetic resonance
- MR equipment
- Magnet types and strengths
- MR computer system
- Operator console
- Sequence Parameters and Options
- MR coils and applications
- Data acquisition and processing
- MR image acquisition
- Equipment safety
- Environment shielding and warning signs
- Patient assessment, monitoring and management
- Emergency response

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

<u>GOAL TYPE</u>	<u>OBJECTIVES</u> Students will be able to	<u>OUTCOMES</u> The student will successfully
** <u>Ethical and Civic Responsibility</u>	analyze and reflect on the ethical dimensions of legal, social, and scientific issues.	1. demonstrate appropriate patient screening prior to MR exam to ensure safety for patients and personnel.
<u>CS</u>	understand the basic concepts to magnetic resonance.	1. describe the basic principles and concepts of magnetic resonance.
<u>CS</u>	understand the major hardware components in MR imaging.	1. explain how the components work together to create an MR image.
<u>CS</u>	recognize the importance of screening equipment in the MR environment.	1. explain how equipment is checked for ferromagnetic materials before being brought into the MR environment.
<u>CS</u>	recognize the medical emergencies.	1. articulate the emergency response as appropriate for a given situation.
<u>CS</u>	understand the importance of contrast administration.	1. determine the appropriate contrast agent and route of administration for the requested MR exam.
<u>CS</u>	recognize the most common MR exams.	1. articulate the proper positioning and selection of the scan parameters for a common MR exam.
<u>CS</u>	recognize the importance of image quality.	1. identify the factors that will influence image quality.
<u>CS</u>	understand appropriate communication skills for patients and family members.	1. demonstrate appropriate communication skills for specific age groups.

G. SPECIAL INFORMATION:

This course may require use of the Internet, the submission of electronically prepared documents and the use of a course management software program. Students who have a disability and need accommodations should contact the instructor or the Student Success Center at the beginning of the semester. This information will be made available in alternative format, such as Braille, large print, or current media, upon request.

H. COURSE CODING INFORMATION: Course Code X/Class Maximum 20; Letter Grade

Revision date: 11/19/19; 03/30/22

AASC Approval date: 12/17/19; 05/03/22

<b>*Riverland Community College Disciplines</b>	<b>MnTC Goal Number</b>
Communication (CM)	<b>1</b>
Natural Sciences (NS)	<b>3</b>
Mathematics/Logical Reasoning (MA)	<b>4</b>
History and the Social & Behavioral Sciences (SS)	<b>5</b>
Humanities and Fine Arts (HU)	<b>6</b>

<b>**Riverland Community College Core Themes</b>	<b>MnTC Goal Number</b>
Critical Thinking (CT)	<b>2</b>
Human Diversity (HD)	<b>7</b>
Global Perspective (GP)	<b>8</b>
Ethical and Civic Responsibility (EC)	<b>9</b>
People and the Environment (PE)	<b>10</b>

\*These five MnTC Goals have been identified as Riverland Community College Disciplines.

\*\* These five MnTC Goals have been identified as Riverland Community College Core Themes.

NOTE: The Minnesota Transfer Curriculum “10 Goal Areas of Emphasis” are reflected in the five required discipline areas and five core themes noted in the Riverland Community College program of study guide and/or college catalog.