

# M219: Introduction to Magnetic Resonance Imaging (MRI)

Winter 2024

Lectures: Mon/Wed 2pm – 3:50pm  
BH-173, CHS, Bauer Auditorium

## Instructors:

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## Learning Objectives:

To introduce the students to the fundamental principles of magnetic resonance imaging.  
To demonstrate basic applications of MRI.

## Grading Structure:

There will be 3 homework assignments and a final exam.

- Homework: 60%
- Class Participation: 10%
- Final Exam: 30%

## Course Schedule:

Lecture	Date	Topic
#1	Jan 8, 2023	Introduction
#2	Jan 10, 2023	MRI Systems I: B0 and Bulk Magnetization
#3	Jan 15, 2023	MLK Holiday
<b>Homework #1 out</b>		
#4	Jan 17, 2023	MRI Systems II: Nuclear Precession and B1
#5	Jan 22, 2023	Bloch Equations and Relaxation I
#6	Jan 24, 2023	Bloch Equations and Relaxation II
#7	Jan 29, 2023	MRI Systems III: Gradients
<b>Homework #1 due, Homework #2 out</b>		
#8	Jan 31, 2023	Imaging Principles
#9	Feb 5, 2023	Spatial Localization I
#10	Feb 7, 2023	Spatial Localization II
#11	Feb 12, 2023	MRI Signal Equation and Basic Image Reconstruction (by Dr. Wu)
#12	Feb 14, 2023	Fast Imaging and Advanced Image Reconstruction (by Dr. Wu)
<b>Homework #2 due, Homework #3 out</b>		
#13	Feb 19, 2023	Presidents' Day Holiday
#14	Feb 21, 2023	Spatial Localization and Imaging Sequences
#15	Feb 26, 2023	Imaging Sequences II
#16	Feb 28, 2023	Imaging Sequences III
#17	Mar 4, 2023	Basics of MR Spectroscopy (by Dr. Thomas)
#18	Mar 6, 2023	Fast MR Spectroscopic Imaging (by Dr. Thomas)
<b>Homework #3 due</b>		
#19	Mar 11, 2023	Basics of MRI Strain Imaging (by Dr. Zhong)
#20	Mar 13, 2023	Basics of Quantitative MRI (by Dr. Christodoulou)
	<b>Mar 18-22</b>	<b>Final Exam</b>