

EE 591: Magnetic Resonance Imaging and Reconstruction

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Meeting Time: TTh 5:00-6:20pm, OHE 100C

Course Materials: <http://mrel.usc.edu/class/591/>

Prerequisites: EE 483; MATLAB experience;
graduate standing or instructor permission

Magnetic resonance imaging (MRI) is a powerful and flexible technique for imaging structures within the body. The acquisition and reconstruction of MR images is uniquely rooted in Fourier analysis, sampling, and linear systems, making it an excellent biomedical application for signal processing students to explore.

This course will first cover the physics of MRI, selective excitation, acquisition, image contrast, volumetric imaging, and the effect of system imperfections; and will then cover advanced topics such as ultra-fast imaging, quantitation, artifact correction, and opportunities for entrepreneurship. There will be lectures twice per week, weekly homework assignments, and at least three scanning demonstrations. By the end of the semester, you will understand how 90% of clinical and research MRI scans are performed, and will be able to follow the latest trends in MRI research.

