**Course Announcement for Spring 2015**

# EE 591: Magnetic Resonance Imaging and Reconstruction


Instructor: Krishna Nayak, knayak@usc.edu
EEB 406, 213-740-3494


Meeting Time: Fridays 1:00 - 3:50pm
Location TBD

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

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

Magnetic resonance imaging (MRI) is an incredibly powerful technique for imaging structure, function, and other properties of soft tissues within the body. The acquisition and reconstruction of images is rooted in Fourier transforms, sampling, and linear systems, making it an excellent application of signal processing concepts.

This course will first cover the physics of MRI, selective excitation, acquisition, linear image reconstruction, image contrast, volumetric imaging, and system imperfections; and will then cover advanced topics such as ultra-fast imaging, quantitative mapping of tissue parameters, artifact correction, and entrepreneurship. Class will meet once per week for three hours. There will be weekly homework assignments, and three demo days at the scanner. By the end of the semester, you will understand how 95% of clinical and research MRI scans are performed. You will also be able to follow the latest trends in MRI research.