Revised Syllabus

Week 1
Monday 10/6   Course Policies; Overview of Imaging Modalities
Wednesday 10/8   X-rays: Basic Physics; Contrast; Source and object magnification.

Week 2
Monday 10/13   X-ray imaging solution; Delta functions and signal expansions; impulse response.
Wednesday 10/15   Review Signal Expansions; Linearity; Superposition; Shift Invariance; Convolution

Week 3
Monday 10/20   X-ray imaging equation; Intro to Computed Tomography (CT)
Wednesday 10/22   Radon Transform; Backprojection; Intro to Fourier Transforms

Week 4
Monday 10/26   Fourier Transform theorems; Modulation Transfer Function.
Wednesday 10/31   Convolution Theorem; CT: Projection Slice Theorem;

Week 5
Monday 11/03   Filtered back projection; Sampling: 1D and 2D sampling, Whitaker-Shannon sampling theorem, aliasing; Application to CT
Wednesday 11/05   MRI: Overview, Basic physics, Bloch Equation

Week 6
Monday 11/10   MRI: Gradients, Signal Equation, Spin-warp pulse sequence
Wednesday 11/12   MRI: Sampling and Windowing; Pulse sequence Design

Week 7
Monday 11/17   MRI: Image Contrast and Pulse Sequence Parameters
Wednesday 11/19   MRI: Slice selection; RF pulse design

Week 8
Monday 11/24   In-class Exam
Wednesday 11/26   MRI: Overview of special topics

Week 9
Monday 12/01   Imaging of Flow and Motion; Cardiac Imaging [E. Wong]
Wednesday 12/03   Diffusion Imaging [L. Frank]

Week 10
Monday 12/08   Functional Brain Imaging [R. Buxton]
Wednesday 12/10   Imaging of Brain Connectivity

Week 11
Finals Week   Project Presentations from 11:30 am to 2:30 pm
Tuesday 12/16