Preliminary Syllabus

**Week 1**
Thursday 9/21  Course Policies, Overview of Imaging Modalities; Intro to X-rays.

**Week 2**
Tuesday 9/26  X-rays: Basic Physics; Contrast; Noise; Image Equation
Thursday 9/28  Linear systems, 1D and 2D convolution; Resolution; Application to X-rays

**Week 3**
Tuesday 10/03  CT: Overview and basic Physics, Radon transform
Thursday 10/05  Fourier Transforms: Overview and basic properties

**Week 4**
Tuesday 10/10  Fourier Transforms and Convolution, Duality, Windowing, Resolution
Thursday 10/12  CT: Projection Slice Theorem; Filtered back projection

**Week 5**
Tuesday 10/17  Sampling: 1D and 2D sampling, Whitaker-Shannon sampling theorem, aliasing; Application to CT
Thursday 10/19  CT: Advanced Topics and Applications

**Week 6**
Tuesday 10/24  Ultrasound: Overview and basic physics
Thursday 10/26  Ultrasound: Beam formation, Scanning modes

**Week 7**
Tuesday 10/31  Sampling Reviewed; Ultrasound: Phased Array systems, Doppler
Thursday 11/02  MRI: Overview, Basic physics, Bloch Equation

**Week 8**
Tuesday 11/07  MRI: Gradients, Signal Equation, Spin-warp pulse sequence
Thursday 11/09  Sampling Reviewed; MRI: Resolution and sampling requirements

**Week 9**
Tuesday 11/14  MRI: Slice Selection; RF Pulse design.
Thursday 11/16  MRI: Image Contrast and Noise

**Week 10**
Tuesday 11/21  MRI: Applications
Thursday 11/23  Thanksgiving Holiday

**Week 11**
Tuesday 11/28  Special Topics
Thursday 11/30  Special Topics