

**Revised Syllabus**

**Week 1**

Thursday 9/27 Course Policies, Overview of Imaging Modalities; Intro to X-rays.

**Week 2**

Tuesday 10/02 X-rays: Basic Physics; Contrast; Noise; Image Equation  
Thursday 10/04 Linear systems, 1D and 2D convolution; Resolution; Application to X-rays

**Week 3**

Tuesday 10/09 CT: Overview and basic Physics, Radon transform  
Thursday 10/11 Fourier Transforms: Overview and basic properties

**Week 4**

Tuesday 10/16 Fourier Transforms and Convolution, Duality, Windowing, Resolution  
Thursday 10/18 CT: Projection Slice Theorem; Filtered back projection

**Week 5**

Tuesday 10/23 No class due to campus closure  
Thursday 10/25 No class due to campus closure

**Week 6**

Tuesday 10/30 Review session led by TA.  
Thursday 11/01 Finish up back projection; Sampling: 1D and 2D sampling, Whitaker-Shannon sampling theorem, aliasing;

**Week 7**

Tuesday 11/06 Finish CT; Start MRI: Overview, Basic physics, Bloch Equation  
Thursday 11/08 MRI: Gradients, Signal Equation, Spin-warp pulse sequence

**Week 8**

Tuesday 11/13 Sampling Reviewed; MRI: Resolution and sampling requirements  
Thursday 11/15 MRI: Slice Selection; RF Pulse design

**Week 9**

Tuesday 11/20 MRI: Image Contrast and Noise  
Thursday 11/22 Thanksgiving Holiday

**Week 10**

Tuesday 11/27 MRI: Fast Imaging Methods  
Thursday 11/29 MRI: Applications

**Week 11**

Tuesday 12/04 Ultrasound: Beam formation; Scanning; Sampling Reviewed  
Thursday 12/06 Ultrasound: Phased Array systems, Doppler

**Week 12**

Thursday 12/13 Final project presentations (8 am to 11 am).