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).