Bioengineering 280A: Principles of Biomedical Imaging **9/17/08**
Fall Quarter 2008

Tentative Syllabus

Week 1	
Thursday 9/25	Course Policies, Overview of Imaging Modalities; Intro to X-rays.
Week 2	
Tuesday 9/30	X-rays: Basic Physics; Contrast; Noise; Image Equation
Thursday 10/02	Linear systems, 1D and 2D convolution; Resolution; Application to X-rays
Week 3	
Tuesday 10/07	CT: Overview and basic Physics, Radon transform
Thursday 10/09	Fourier Transforms: Overview and basic properties
Week 4	
Tuesday 10/14	Fourier Transforms and Convolution, Duality, Windowing, Resolution
Thursday 10/16	CT: Projection Slice Theorem; Filtered back projection
Week 5	
Tuesday 10/21	Sampling: 1D and 2D sampling, Whitaker-Shannon sampling theorem, aliasing; Application to CT
Thursday 10/23	MRI: Overview, Basic physics, Bloch Equation
Week 6	
Tuesday 10/28	MRI: Gradients, Signal Equation, Spin-warp pulse sequence
Thursday 10/30	Sampling Reviewed; MRI: Resolution and sampling requirements
Week 7	
Tuesday 11/04	MRI: Slice Selection; RF Pulse design
Thursday 11/06	MRI: Image Contrast and Noise
Week 8	
Tuesday 11/11	**NO CLASS: Veterans Day Holiday**
Thursday 11/13	MRI: Fast Imaging Methods
Week 9	
Tuesday 11/18	MRI: Advanced Image Reconstruction
Thursday 11/20	MRI: Applications
Week 10	
Tuesday 11/25	Ultrasound: Overview and basic physics
Thursday 11/27	**NO CLASS: Thanksgiving Holiday**
Week 11	
Tuesday 12/02	Ultrasound: Beam formation; Scanning; Sampling Reviewed
Thursday 12/04	Ultrasound: Phased Array systems, Doppler
Week 12	
Finals Week	Final project presentations (8 am to 11 am) on day of scheduled final.