

Date	Lecture	Homework Assignment	In-Class Activity
3/11 (Proposed start)	Registration Concepts: Matrix mappings and transforms	Homework #1 Assigned	
3/13	Degrees of freedom and strategies for minimizing registration error: rigid, affine, and deformable (elastic) registration		
3/15	Registration and optimization considerations: Cost Function, Numerical Optimization		
3/25	Student Project Proposals		Student Presentations
3/27	In-Class introduction to ITK/VTK (C++ image processing tool box)		
3/29	Set-up virtual machine loaded with ITK/VTK package*		Introduce VM and Cmake for image load and display [Drs. Hahn/Fain]
4/1	Registration Basics	Homework #1 Due Homework #2 Assigned (ITK/VTK Problems)	Registration Activity (Day 1) [Dr. Hahn]
4/3	Registration Exercises and Discussion	ITK/VTK	Registration Activity (Day 2) [Dr. Hahn]
4/5	<ul style="list-style-type: none"> • Registration Wrap-Up • Introduction to Segmentation Concepts 		
4/8	Region Growing, Morphological Operators, Gradients and Edge Detectors		
4/10	<u>Topological Methods:</u> Watershed Transform		
4/12	<u>General Approaches:</u> Segmentation Basics in ITK/VTK	ITK/VTK	Segmentation Activity (Day 1) [Dr. Hahn]

MP574 Spring, 2019 Image Processing and Measurement Module

4/15	Level Sets ("Graph Cut" as a related approach)		
4/17	Active Contour introduction		
4/19	Active Contour cost functions and numerical optimization		
4/22	<u>Classifiers:</u> Bayesian and K-means		
4/24	Machine Learning		
4/26	Neural networks		
4/29	Convolutional neural networks (CNN) and segmentation approaches	Homework #2 Due	
5/1	Final Projects 1		In-Class Presentations
5/3	Final Projects 2		In-Class Presentations
5/6		Final Reports Due	
* https://itk.org ; https://vtk.org ;			