

## **ECE 6282 – Radar Imaging**

### **Topical Outline**

Synthetic Aperture Radar (SAR) Applications Overview

SAR and Sonar Image Interpretation

SAR/SAS and “Doppler”

Pulse and LFM signaling (two-pass and one-pass processing)

Range Processing (matched filtering and fast-time deramp techniques)

Cross Range Processing (matched filtering and slow-time dechirp techniques)

Polar Formatting Processing (with study of inherent approximation’s impact on image quality)

Approximation-Free "Modeless" SAR Processing (processing common to stripmap and spotlight modes)

Reramp and Rechirp Processing (Omega-K processing of Polar Format data)

Physical Aperture Effects on Synthetic Aperture Processing

Spotlight SAR Omega-K Processing Specifics

Stripmap SAR Omega-K Processing Specifics

Digital Spotlighting for Sidelobe Suppression in Subaperture Processing

Subpatch Processing Algorithms and Wide-Area Mosaic Image Formation

Noncoherent Mosaic Image Formation with Polar Format Processing

Coherent Mosaic Image Formation with Omega-K Processing

Circular SAR and a New Type of 3-D Imaging

Back Projection Algorithms

Phase Error Effects (with some discussion of motion compensation)

Autofocus Techniques (map drift and phase gradient algorithm)