ECE/AE 456 Course Schedule Fall (Tentative)

Date	Lecture	Laboratory	Reading	Homework
Lecture 1	Course Overview and Introduction of GPS		Ch 1	
Lecture 2	Overview of GPS Satellites and Receivers		2.2-2.4	
Lecture 3	Basic Principles of Satellite Navigation Systems			
Labor Day	NO CLASS			
Lecture 4	The Newton-Raphson Method			HW #1 (1-3)
Lecture 5	Reference Frames		4.1	
Lecture 6	Time Standards (read “Time and Frequency Dissemination”)		4.2	
Lecture 7	Coordinate Transforms	LAB 1: A First Look at GPS signal	4.A	HW #2 (4-5)
Lecture 8	Orbital Dynamics		4.3.1-4.3.2	
Lecture 9	Calculating the Satellite Location		4.3.3	
Lecture 10	Corrections to the Ephemeredes (by Prof. Makela)		4.3.4-4.3.5	HW #3 (6-7)
Lecture 11	The Effects of Relativity on GPS (guest lecture: Prof. Carney)			
Lecture 12	The GPS Signal and Spread-Spectrum Communications (read “The ABCs of Spread Spectrum – A tutorial”)		9.1	
Lecture 13	Pseudo-Random Codes	LAB 2: Ephemeredes and Satellite Locations	9.2.1, 9.5	HW #4 (8-10)
Lecture 14	GPS Signal Structure			
Lecture 15	Range and Pseudorange		5.1	
Lecture 16	Phase Range			HW #5 (11-13)
Lecture 17	Code Range Navigation Solution		6.1	
Lecture 18	Code Range Navigation Solution			
Lecture 19	Phase Range Navigation Solution	LAB 3: GPS Observables	7.1-7.2	HW #6 (14-17)
Lecture 20	Error Statistics			
Lecture 21	Ranging Errors		5.4	
Lecture 22	Dilution of Precision			HW #7 (18-22)
Lecture 23	Overdetermined Navigation Solution			
Lecture 24	Propagation of Radio Waves in a Plasma: The Effects of the Ionosphere		5.3	
Lecture 25	Atmospheric Effects	LAB 4: The Navigation Solution		HW #8 (23-25)
Lecture 26	Differential GPS		2.5	
Lecture 27	The Wide Area Augmentation System			
Lecture 28	Verterbi Decoding			
Lecture 29	Midterm Review			
Midterm	MIDTERM (IN CLASS)			
Lecture 30	Verterbi Decoding			
Lecture 31	Applying WAAS Corrections	LAB 5: Differential GPS		
Lecture 32	Design Project Overview			
Lecture 33	Velocity Determination		6.2	HW #9 (26-31)
Lecture 34	Future Improvements to GPS		3.4	
Lecture 35	Alternatives to GPS (GLONASS & Galileo)	DESIGN PROJECT	3.5-3.8	
Lecture 36	Alternatives to GPS (GLONASS & Galileo)			HW #10 (33-35)
Lecture 37	Preparing for Final Project Presentation			

Thanksgiving	NO CLASS	
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Lecture 38 (M 12/2)	Final Project Presentations	DESIGN PROJECT
Lecture 39 (W 12/4)	Final Project Presentations	
Lecture 40 (F 12/6)	Final Project Presentations	
Lecture 41 (M 12/9)	Final Project Presentations	DESIGN PROJECT (Address points raised in presentation)
Lecture 42 (W 12/11)	Final Project Presentations	
Final Report (F 12/20)	Final Project Report Due	