

Lecture

Course Overview

EE 570: Location and Navigation

Lecture Notes Update on January 18, 2014

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1 Course Outline

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- Required Textbook: [Principles of GNSS, Inertial, and Multisensor Integrated Navigation Systems](#) , Second Edition, Paul D. Groves, 2013.
- Recommended Software: MATLAB or Octave
- Lectures: Tues and Thu 12:30-13:45 Workman 116
- Instructor: Aly El-Osery

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Acknowledgment

This course has been initiated, developed and previously co-taught by Dr. Stephen Bruder and myself. Due to scheduling conflict we were not able to co-teach the course this semester. Because of Stephen's dedication and attention to details, my life is a lot easier covering a good portion of the course.

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2 Grading

Grading

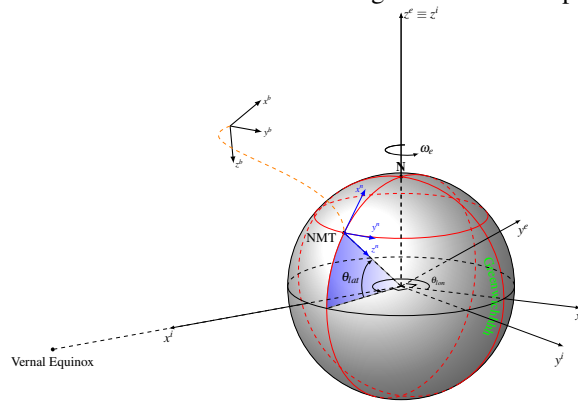
- Homework assignment: 30%
- Two mini-projects: 10% each
- Final project: 30%
- Final report: 10%
- Class participation: 10%

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3 Course Description

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This course will cover the basics of terrestrial location and navigation with an emphasis on prac-



tical exposure to technology.

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Part I: Navigation Mathematics

- Introduction to navigation
 - Coordinate frames
 - Kinematics
 - Earth surface and gravity
 - Frame transformation
- } Ch. 2

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Part II: Navigation Sensors and INS Mechanization

- Accelerometers
 - Gyroscopes
 - Error Characteristics
 - Inertial navigation equations
- } Ch. 4& 5

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Part III: INS/GPS Integration

- GPS
 - Kalman filtering
 - Integration architecture
 - System Model
 - Measurement model
- Ch. 8
Ch. 3
} Ch. 14-16

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