CN 482 Fundamentals of GPS/INS Integration I
September 22, 2009, 8:30 am-12:00 pm, CEU: 3.0
GNSS Solutions® Tutorials prior to ION GNSS 2009, September 21-22, 2009
Marriott Savannah Riverfront, Savannah, GA

Instructor: Dr. Mohinder S. Grewal, Professor of Electrical and Computer Engineering, California State University, Fullerton, CA.

Prerequisites: Knowledge of mathematics and fundamentals of Kalman filtering will be helpful. CN 480 and CN 481, Fundamentals of Kalman Filtering for GPS/INS Integration I and II, are recommended.

Included Audience: This course is for engineers, scientists and managers. It will cover the basics of GPS/INS integration.

Notes Provided: Slides presented will be professionally spiral bound, with clear plastic cover, including color to add clarity where needed.

Reference List: A reference list will be provided as part of the note package for completeness and to allow the interested attendee to obtain additional information.

Course Overview: This course discusses the integration of GPS and INS.

Course Content: The main topics to be covered in the course are

- Fundamentals of Inertial Navigation
- Coordinate Transformations
- INS Descriptions
- INS Vertical Channel, Schuler Oscillation, and Coriolis Effect, Coning and Sculling, and Gravity Modeling
- Sensor Specifications and Models
- Application of Kalman Filtering to Inertial Navigation Systems & GPS with Examples
    - Feed Forward/Feedback Configuration
    - Tightly/Loosely Coupled
    - Deep INS/GPS
- INS Error Models for Strapdown System
- Extended Kalman Filter Mechanization and Software Modules

Course Outcomes: At the completion of the course, attendees should have a better understanding of the integration of GPS/INS, inertial navigation, INS error models and tightly and loosely coupled systems. For additional knowledge on GPS/INS integration, CN 483, Fundamentals of GPS/INS Integration II, is recommended.