

CN 481 Fundamentals of Kalman Filtering for GPS/INS Integration II
September 20, 2010, 1:30 pm-5:00 pm, CEU: 3.0
GNSS Solutions® Tutorials prior to ION GNSS 2010, September 20-21, 2010
Oregon Convention Center, Portland, Oregon, USA

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

Prerequisites: Knowledge of mathematics, GPS and INS basics will be helpful. CN 480 Fundamentals of Kalman Filtering for GPS/INS Integration I is recommended.

Included Audience: This course is for engineers, scientists and managers. It will cover the basics of Kalman filtering for 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 utilizes the fundamentals of Kalman filtering for application to GPS/INS integration. It addresses subtleties, problems, and limitations of estimation theory as applied to real world situations encountered in GPS, INS, and navigation and provides application examples.

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

- Nonlinear Kalman Filters
- Examples
- Sigma Point Kalman Filter (Unscented)
- Square Root Filtering
- Example with MATLAB®
- Prefiltering and Data Rejection
- Divergence and Effective Cures
- Kalman Filter Engineering
- Nonlinearity Considerations
- Suboptimal Filtering
- Kalman Filter Monitoring
- Monitoring Filter Health

Course Outcomes: At the completion of the course, attendees should have a thorough understanding of the fundamentals of linear and nonlinear discrete Kalman filtering. For additional knowledge on GPS/INS Integration, CN 482 and 483 Fundamentals of GPS/INS Integration I and II, are recommended.