

**CN 480 Fundamentals of Kalman Filtering for GPS/INS Integration I**  
**September 20, 2010, 8:30 am-12:00 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.

**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 emphasizes the fundamentals of Kalman filtering needed for application to GPS/INS integration. Main topics include:

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

- What is a Kalman Filter
- Discrete Kalman Filter
- Continuous Kalman Filter
- Relationship Between Discrete and Continuous Process Noise
- Shaping Filters
- Example (1 State)
- Example (6 States) with MATLAB®
- Measurements as Scalars (No Matrix Inversion)

**Course Outcomes:** At the completion of the course, attendees should understand the fundamentals of Kalman filtering and GPS/INS integration. For additional knowledge on inertial navigation systems and GPS, CN481 Fundamentals of Kalman Filtering for GPS/INS Integration II is recommended.