

CN462 Applications of Strapdown Inertial Navigation Systems
September 15, 2008, 6:45 pm-9:30 pm, CEU: 3.0, prior to ION GNSS 2008
Marriott Savannah Riverfront, Savannah, GA

Instructor: Dr. Andrey Soloviev, Senior Research Engineer, Ohio University

Prerequisite: Some knowledge of mathematics and computer science will be useful. Additional benefit will be obtained with knowledge of strapdown inertial navigation systems (e.g., CN460 Introduction to Strapdown Inertial Navigation Systems I & CN461 Introduction to Strapdown Inertial Navigation Systems II).

Intended Audience: Engineers, scientists, and managers interested in the application areas of strapdown inertial navigation systems. The course details various stand-alone and integrated applications of strapdown inertial navigation systems.

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 focuses on practical applications of the strapdown inertial navigation technology. Types of inertial applications are discussed. Challenges of using strapdown INS for practical application areas are addressed. Specific application examples are considered with the emphasis on INS specification requirements and INS performance characteristics.

Course Content: The main topics to be covered by this course are:

- Types of strapdown INS applications:
 - Stand-alone applications
 - INS as a core part of integrated navigation systems
- Challenges of using strapdown inertial in practical application areas:
 - Sensor and packaging errors
 - Vibrations
 - Sculling effect
 - Coning effect
- Example stand-alone INS applications:
 - Long-term inertial coasting for aviation applications
- Example integrated INS applications:
 - Attitude and Heading Reference Systems (AHRS)
 - Short-term INS coasting
 - Aiding of GNSS signal accumulation for high-sensitivity GNSS

Course Outcomes: At the completion of this course, the attendee should have a good understand of various stand-alone and integrated applications of strapdown inertial navigation systems, as well as, the common error that effect them. For additional knowledge on the

integration of strapdown inertial navigation systems and GPS, CN481 Fundamentals of Kalman Filtering for GPS/INS Integration I and CN482 Fundamentals of Kalman Filtering for GPS/INS Integration II are recommended.