

CN462 Applications of Strapdown Inertial Navigation Systems I
September 21, 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. Andrey Soloviev, Research Assistant Professor, University of Florida

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 technology. Types of inertial applications are discussed. Challenges of using strapdown inertial navigation system (INS) for practical application areas are addressed. Specific application examples for stand-alone and integrated INS navigation 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
- Inertial sensors:
 - Sensor specifications – what do they mean and how to “read” them
 - Main sensor technologies, their current state and perspectives
- Challenges of using strapdown inertial in practical application areas:
 - Sensor and packaging errors
 - Vibrations
 - Sculling and coning errors
- Example stand-alone INS applications:
 - Long-term inertial coasting for aviation applications
- Example integrated INS applications:
 - GPS/INS integration for weak GPS signal processing

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, CN463 Applications of Strapdown Inertial Navigation II – Integrated Inertial Navigation Systems is recommended.