

CN471 Integrated Navigation Systems for Miniature Aerial Vehicle Applications
September 21, 2009, 6:45 pm - 9:30 pm, CEU: 2.5
GNSS Solutions® Tutorials prior to ION GNSS 2009, September 21-22, 2009
Marriott Savannah Riverfront, Savannah, GA

Instructor: Dr. Demoz Gebre-Egziabher, P.E., Associate Professor, University of Minnesota, Twin Cities Campus.

Prerequisite: Some basic knowledge of GNSS, mathematics and computer science will be useful. Information with CN405 Fundamentals of GNSS I would be helpful.

Intended Audience: Engineers, scientists, and managers interested in multi-sensor systems used in low-cost navigation or attitude determination systems. These systems are intended for applications such as Micro Aerial Vehicles (MAVs) or Uninhabited Ground Vehicles (UGVs).

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 issues associated with integrated navigation systems for navigation, attitude determination and control of small aerial vehicles.

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

- Overview of issues associated with miniature aerial vehicle navigation
 - Overview of multi-sensor systems
 - Applications of low cost multi-sensor systems
- Sensors, sensor characterization and calibration
- GPS for position, velocity, and attitude
 - Inertial sensors
 - Magnetometers
 - Air data sensors
- Case studies of integrated navigation and attitude determination systems
 - Single and Multi-antenna GNSS/INS systems
 - Low cost inertial systems with non-GNSS aiding

Course Outcomes: At the completion of this course, the attendee should have the ability to understand the issues associated with the design of integrated multi-sensor systems for navigation and attitude determination. For additional knowledge on the integration of GPS and INS, CN462/CN463 Applications of Strapdown Inertial Navigation I/II or CN481/482 Fundamentals of Kalman Filtering for GPS/INS Integration I/II are recommended.