CN416 Fundamentals of Pseudolites for GNSS
ION GNSS 2007, September 24, 2007, 6:45 am-9:30 pm, CEU: 2.5

Instructor: Dr. Stewart Cobb, Novariant Corporation

Prerequisite: Knowledge of mathematics, computer science, and introduction to satellite navigation systems (e.g., CN405 or CN406 Fundamentals of GNSS using GPS I or II) will be useful.

Intended Audience: Engineers, scientists, and managers interested in the design, development, implementation of pseudolites using GPS, Galileo, Glonass and/or other satellite navigation system. The course provides details on the many aspects of pseudolites for potential enhanced systems performance or to be used as a research tool.

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 presents the many aspects of pseudolites in GNSS applications. System trade-offs and implementations considerations for high performance applications will be presented.

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

- Implementation of pseudolite systems
  - Benefits and limitations of pseudolites
  - Stand-alone pseudolite-only navigation systems
  - Differential pseudolite systems; integrity
  - Design trade-off issues and requirements
- Pseudolite signal structure considerations
  - PRN code and data selection
  - Dynamic range, near-far; pulsing format
  - Trade-offs; timing criteria and acquisition
  - Error sources; troposphere, multipath, etc.
- Pseudolite signal generation
  - C/A code and P/Wideband generators
  - RF power and pulsing
  - Clock steering and timing
- Pseudolite receiver considerations
- Off-frequency augmentation systems
- Case Study: airborne DGPS/DAPL application.

Course Outcomes: At the completion of this course, the attendee should have the ability to understand the fundamentals of pseudolites for GNSS systems in the presents of measurement

error. Additionally, knowledge gain in the understanding of various stand-alone, differential pseudolite and off-frequency augmentation techniques to enable enhanced performance.