

**CN434 Receiver Signal Processing for Future GNSS Signals - Advanced**  
**September 21, 2010, 1:30 pm-5:00 pm, CEU: 3.0**  
**GNSS Solutions® Tutorials prior to ION GNSS 2010, September 20-21, 2010**  
**Oregon Convention Center, Portland, Oregon, USA**

**Instructor:** Dr. Olivier Julien, Ecole Nationale de l'Aviation Civile (ENAC)

**Prerequisite:** Some knowledge of mathematics and computer science will be useful. Additionally, knowledge of basic future GNSS signal processing and receiver functions will be important (i.e., CN433 Receiver Signal Processing for Future GNSS Signals - Introduction).

**Intended Audience:** Engineers, scientists, and managers interested in the area of GNSS using GPS, Galileo, and/or other satellite navigation systems. The course will benefit to attendees interested in understanding specific GNSS receiver signal processing and architectures (tracking) associated to future civil GNSS signals. It will also benefit to attendees interested in assessing the impact of multipath and interference on the tracking performance of these signals.

**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 provides an excellent overview of future GNSS signal processing and the many aspects that affect GNSS receiver performance. The course first investigates specific receiver tracking architectures dedicated to future civil GNSS signals, and then characterizes the resistance of these signals towards multipath and interference environments with respect to GPS C/A.

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

Advanced code tracking architectures:

- Introduction to typical tracking techniques against BOC-related tracking ambiguity,
- MBOC tracking for wide-band and narrow-band receivers, and
- ALTBOC tracking for wide-band and very-wide-band receivers

Multipath effects on tracking:

- Multipath model and impact on code and phase tracking
- Phase tracking multipath envelopes for future GNSS civil signals
- Code tracking multipath envelopes for future GNSS civil signals

Interference effects on tracking:

- Main interference threats and models in L1 and E5 bands
- Impact of future GNSS signals' structure on the receiver capability to mitigate narrow- and wide-band interference
- Introduction to pulsed interference effects and mitigation on GPS L5 and Galileo E5

**Course Outcomes:** At the completion of this course, the attendee should have a solid understanding of the fundamentals of GNSS signal processing, including advanced tracking and performance aspects of future GNSS signals.