July 14-17, 2020
Hyatt House Falls Church/
8296 Glass Alley
Fairfax, Virginia, USA, 22031

PUBLIC VENUE OR ON-SITE COURSE

Course 346: GPS/GNSS Operations for Engineers & Technical Professionals:
Principles, Technology, Applications and an Introduction to Basic DGPS (2.7 CEUs)

DAY 1 AND 2 MAY BE TAKEN AS COURSE 122. SEE REGISTRATION FORM

Day 1

Dr. Chris Hegarty

Fundamentals of GPS operation, Overview of how the system works. U.S. policy and current status.

GPS System Description
- Overview and terminology
- Principles of operation
- Augmentations
- Trilateration
- Performance overview
- Modernization

GPS Policy and Context
- Condensed navigation system history
- GPS policy and governance
- Modernization programs
- Ground segment
- Other satellite navigation systems

GPS Applications
- Land
- Marine
- Aviation
- Science
- Personal navigation
- Accuracy measures
- Error sources

GPS Signal Processing
- Local- and wide-area architectures
- Code vs. carrier-phase based systems
- Data links: pseudolites
- Performance overview

Differential Concepts
- Differential error sources
- Measurement processing
- Ambiguity resolution
- Error budgets

DGPS Standards and Systems
- RTCM SC104 message format
- IGS/USCG maritime DGPS and National DGPS (NDGPS)
- Commercial satellite-based systems
- Aviation systems: satellite-based and ground-based (SBAS/GSAS)
- RINEX format, CORS and IGS networks
- Precise time transfer

GPS Signal Structure and Message Content
- Signal structure
- Signal properties
- Navigation message

GPS Receiver Overview
- Functional overview
- Synchronization concepts
- Code tracking
- Carrier tracking
- Data demodulation

GPS Antennas
- Antenna types
- Antenna performance characteristics
- Preamplifiers
- Low noise amplifiers (LNAs)
- Noise figure

Materials You Will Keep
- A color electronic copy of all course notes on a USB Drive or CD-ROM. Bringing a laptop to this class is highly recommended for taking notes using the Adobe® Acrobat® sticky notes feature; power access will be provided.
- A black and white hard copy of the course notes will also be provided.

Public Venue Course Fee Entitles You to the Following Books

Instructor

Dr. Chris Hegarty

Course Description
Take this 4-day course to gain a comprehensive understanding of GPS/GNSS system concepts, design and operation, including information on GPS signal processing by the receiver; techniques by which GPS obtains position, velocity and time; and a brief introduction to differential GPS (DGPS) and Kalman filtering. This course is similar to Course 356 (5 days), but with less emphasis on DGPS and Kalman filtering.

Objectives
This course is designed to give you
- A comprehensive introduction to GPS, system concepts, an introduction to DGPS, design, operation, implementation and applications.
- Detailed information on the GPS signal, its processing by the receiver, and the techniques by which GPS obtains position, velocity and time.
- Current information on the status, plans, schedule and capabilities of GPS, as well as other satellite-based systems with position velocity and time determination applications.
- Information to fill the technical gaps for those working in the GPS/GNSS fields.

Who Should Attend?
Excellent for engineering staff who need to be rapidly brought up to speed on GNSS, and for those already working in GPS who need exposure to the system as a whole in order to work more effectively.

Prerequisites
Familiarity with engineering terms and analysis techniques. General familiarity with matrix operations and familiarity with signal processing techniques is desirable.

To REGISTER or for MORE INFORMATION, Contact Carolyn McDonald at (703) 256-8900 or cmcdonald@navtechgps.com.