



**INSTITUTO DE
AGRIMENSORES**
COLEGIO DE INGENIEROS Y AGRIMENSORES DE PUERTO RICO



**Study Group Agenda
3 de junio de 2023
Sede CIAPR Salón Ing. Harry Villegas
8:00am – 5:00pm**

FS – Fundamental of Surveying

1. Surveying Processes and Methods

- A. Instrumentation (e.g., GNSS/GPS, levels, total stations, robotic total stations, scanners, UAS)
- B. GNSS/GPS surveys (e.g., static, kinematic, OPUS, real-time networks)
- C. Control surveys (e.g., horizontal, vertical, network design, accuracy standards)
- D. Cadastral (e.g., Public Land Survey System [PLSS], boundary, metes and bounds, land title)
- E. Topographic surveys
- F. Construction surveys (e.g., layout, as-built, quantity)
- G. Land development (e.g., subdivision design/platting, land use, environmental, flood plains, wetlands)
- H. Field record keeping and documentation (e.g., procedures, field books, raw data files)

2. Mapping Processes and Methods

- A. Basic mapping concepts (e.g., scaling, symbols, features, legend, contours, cartography)
- B. Types of maps (e.g., plan and profile, cross section, plat, record of survey, ALTA, topographic, planimetric)
- C. CAD (e.g., 2-D, 3-D, building information modeling [BIM])
- D. GIS (e.g., feature collection, map projections, coordinate systems, metadata, database design and management, spatial data analysis, GIS applications)
- E. Digital terrain model (e.g., machine control, triangulated irregular network [TIN], digital surface model, digital elevation model)
- F. Photogrammetry and remote sensing (e.g., close range, conventional, softcopy, ground control, quality control, flight planning, project planning, UAS, drone, LiDAR, satellite, digital image analysis and processing)

PS – Principles and Practice of Surveying

2. *Professional Survey Practices*

- A. Public/Private Record Sources
 - 1. Resources for private and public records
 - 2. Local public records indexing and filing system
 - 3. Local survey office records
- B. Documentation, Supervision, and Clear Communication of Field Procedures
 - 1. Field surveying techniques
 - 2. Field surveying practices
 - 3. Data collection protocols
- C. GPS/GNSS including satellite constellations, static GPS, RTK, PPP, and virtual networks
- D. Surveying Principles and Computations
 - 1. Technical computations
 - 2. Applicable software
- E. Monumentation Standards
 - 1. Applicable monumentation criteria
 - 2. Monument types
- F. Land Development Solutions
 - 1. Regulatory land development criteria
 - 2. Construction criteria
 - 3. Land development implementation procedures
- G. Survey Maps/Plats/Reports
 - 1. Technical communications by schematic, platting, and mapping processes and procedures
 - 2. Communication options
- H. GIS
 - 1. GIS spatial databases and metadata
 - 2. Datums and projections related to GIS

3. *Standards and Specifications*

- A. BLM Manual of Surveying Instructions
- B. ALTA/NSPS Land Title Survey Standards
 - 1. Current ALTA/NSPS Land Title Survey Standards
 - 2. State statutes regarding boundary surveys in conjunction with ALTA/NSPS Land Title Surveys
- C. FEMA Requirements
 - 1. FEMA specifications and instructions
 - 2. Horizontal and vertical datums related to FEMA flood zones
 - 3. Current FEMA elevation certificate
 - 4. FEMA Flood Insurance Study