GEOINT Professional Certification
Cartography Proficiency Level II
Essential Body of Knowledge (EBK)
27 March 2023

Core Competency 1 - Extraction and Attribution (18%)

Derive and describe cultural and physical features and geospatial data from source material using appropriate techniques and methods. Determine mensuration requirements (e.g., length, height, volume) and measure objects and phenomena to determine the dimensions or relative size of objects. Analyze maps, charts, or softcopy geospatial data (e.g., imagery) to derive characteristics of objects and/or features, terrain, locations, or other information.

Terminal and Enabling Certification Objectives (TCOs & ECOs)
TCO 1: Understand appropriate techniques and methods to derive and attribute features from source material.
ECO 1.1: Select the proper specifications or guidance for a product or data set.
ECO 1.2: Explain the difference between raster and vector data and products.
ECO 1.3: Understand data update standards, principles, and techniques (ex. attribution, geometry, metadata).
ECO 1.4: Determine applicable scale.
ECO 1.5: Describe features according to a product specification or mission specific guidance.
ECO 1.6: Define and discuss geospatial topology.
TCO 2: Apply measuring techniques to determine the dimensions or relative size of objects.
ECO 2.1: Determine the measurement or dimension of an object.
ECO 2.2: Employ the tool or technique needed to measure an object(s).
TCO 3: Use imagery interpretation principles and image enhancement tools to recognize and identify features, terrain, locations, or anomalies.
ECO 3.1: Use imagery interpretation principles to recognize a feature or location.
ECO 3.2: Use imagery interpretation principles to recognize terrain variations.
ECO 3.3: Use existing analytical and image enhancement tools to identify anomalies.
ECO 3.4: Understand the elements of imagery interpretation principles (size, shape, shadow, texture, etc.).
ECO 3.5: Use the elements of imagery interpretation to identify indicators of change in an area of interest.

Approved for public release, 23-01215

Core Competency 2 - Production (16%) Generate, edit, and demonstrate knowledge of products/data sets to meet customer needs and requirements using relevant source materials and software.
Terminal and Enabling Certification Objectives (TCOs & ECOs)
TCO 4: Apply cartographic processes to produce products and services.
ECO 4.1: Recognize National System for Geospatial Intelligence (NSG) cartographic finishing guidance and standards.
ECO 4.2: Match symbol to appropriate map/chart feature based on guidance and standards.
ECO 4.3: Use appropriate standards and guidance for map/chart display and annotation.
ECO 4.4: Recognize storage locations for geospatial products and data.
ECO 4.5: Identify topographic, maritime, and aeronautical products.
ECO 4.6: Display proper cartographic representation.
ECO 4.7: Identify appropriate cartographic (feature and terrain) representation through visualization techniques.
ECO 4.8: Differentiate between the tools used to create comprehensive datasets from multiple sources (ex. merge, append, mosaic, conflate).
TCO 5: Understand how to perform cartography in a cloud environment.
ECO 5.1: Understand how to access and use cartographic production tools inside the cloud.
ECO 5.2: Recognize cloud terminology (i.e. virtual environments, cloud architecture, cloud computing).
ECO 5.3: Understand cartographic production guidelines, standards, and principles inside the cloud.
Core Competency 3 - Safety of Navigation (13%) Analyze geospatial data to populate and maintain digital databases, charts, libraries, and other products critical to navigation. Prepare navigational products and information for partners and customers in a variety of standard and unique formats. Demonstrate knowledge of aeronautical, topographic, and maritime navigation principles and practices.
Terminal and Enabling Certification Objectives (TCOs & ECOs)
TCO 6: Recognize navigational data that is used to populate and maintain databases, charts, publications, and other products critical to safety of navigation.
ECO 6.1: Identify maritime and land scale band types (e.g., Overview, General, Coastal, Approach, Harbor, Berthing).
ECO 6.2: Recognize primary maritime and land products for digital navigation data (i.e. Digital Nautical Chart (DNC), Electronic Navigation Chart (ENC), Topographic Data Store (TDS), Multinational Geospatial Co-production Program (MGCP), and NGA Open Mapping Enclave (NOME)).
ECO 6.3: Identify features critical for maritime navigation.
ECO 6.4: Identify features critical for land/topo navigation.
ECO 6.5: Identify features critical for aeronautical navigation.

TCO 7: Understand navigation principles and practices.
ECO 7.1: Understand the differences between navigational aids (NAVAIDS) (e.g., buoys, beacons, lights, towers, Very High Frequency (VHF) Omnidirectional Radio Beacon (VOR), Tactical Air Navigation Aid Beacon (TACAN), etc.).
ECO 7.2: Recognize different types of maritime limits (e.g. anchorage areas, traffic separation schemes, restricted areas, etc.).
ECO 7.3: Explain the importance of using critical, support, and fill soundings.
ECO 7.4: Explain obstructions as they relate to marine navigation.
ECO 7.5: Understand methods of displaying digital and electronic navigation products.
ECO 7.6: Explain obstructions as they relate to land navigation (e.g., vertical obstruction).
ECO 7.7: Recognize features important to land navigation (e.g., roads, built up areas, topography, etc.).
TCO 8: Recognize sources of information that are used to create navigational products.
ECO 8.1: Recognize nautical publications and safety of navigation products (e.g. List of Lights, Chart No. 1, World Port Index, Standard Nautical Charts (SNC), Electronic Nautical Charts (ENC), Digital Nautical Charts (DNC), Fleet Guides, Sailing Directions, Tide Tables, etc).
ECO 8.2: Recognize data sources used for land and aeronautical safety of navigation (e.g., vertical obstructions, airfields, elevation data sets, etc.).
Core Competency 4 - Tools and Methods (13%) Apply, adapt, or develop tools and methods to comply with standards and improve products. Understand datum, coordinate, projection, and grid systems. Validate geodetic information on products. Apply datum shifts to convert information between local datums, grid systems, and World Geodetic System (WGS) 84.
Terminal and Enabling Certification Objectives (TCOs & ECOs)
TCO 9: Recognize image registration, mensuration, and rectification methods and their uses.
ECO 9.1: Recognize various methods of image manipulation.
ECO 9.2: Select appropriate image manipulation for an intended use.
TCO 10: Understand datum, coordinate, projection and grid systems.
ECO 10.1: Describe the process of interpreting latitude and longitude or Military Grid Reference System (MGRS).
ECO 10.2: Define and explain the difference between horizontal and vertical datums.
ECO 10.3: Recognize the appropriate projection for an intended use.
ECO 10.4: Differentiate between a datum and a projection.
ECO 10.5: Explain the major advantages of using a Mercator projection for standard nautical charts.
ECO 10.6: Understand the difference between geographic and planar coordinate systems.
ECO 10.7: Understand the difference between grid north, true north, and magnetic north.

Core Competency 5 - Quality Assurance (16%) Apply appropriate processes and procedures to ensure the overall quality of information, knowledge, and geospatial data (to include aeronautical, geodetic, maritime, and topographic information) is accurate, readable, and usable.
Terminal and Enabling Certification Objectives (TCOs & ECOs)
TCO 11: Understand processes and procedures to ensure the quality of geospatial data and map/chart finishing.
ECO 11.1: Identify marginalia discrepancies on a map or chart.
ECO 11.2: Identify and explain topological discrepancies.
ECO 11.3: Identify discrepancies in terrain (e.g. contours, spot heights), features, and attribution.
ECO 11.4: Identify symbology discrepancies to include color, patterns, and annotations.
ECO 11.5: Identify differences between topographic map/chart products.
ECO 11.6: Identify differences between nautical map/chart products.
ECO 11.7: Identify differences between aeronautical map/chart products.
ECO 11.8: Understand International Organization of Standardization (ISO) and standard Quality Assurance techniques and processes.
Core Competency 6 - Researching (11%) Obtain, evaluate, organize, and maintain cartographic data and resources. Understand customer organizations and operations.
Terminal and Enabling Certification Objectives (TCOs & ECOs)
TCO 12: Understand how to obtain and evaluate information and geospatial data.
ECO 12.1: Recognize types of cartographic data sources.
ECO 12.2: Select the appropriate image source for a specific product.
ECO 12.3: Understand how to evaluate and rank sources for a product or data set.
ECO 12.4: Explain how to query for a subset of data to meet product requirements.
TCO 13: Understand how to organize and maintain information and geospatial data.
ECO 13.1: Determine the proper source material required for specific product generation (e.g., GeoNames, Automated Air Facilities Information File (AAFIF), Digital Vertical Obstruction File (DVOF)).

Core Competency 7 - Data/Information Processing (13%) Transform, translate, or manipulate geospatial data. Format, catalog, and/or filter geospatial data to facilitate discovery, access, integration, and interpretation.
Terminal and Enabling Certification Objectives (TCOs & ECOs)
TCO 14: Format, catalog, and attribute metadata per specifications.
ECO 14.1: Recognize standard geospatial data formats to include imagery and terrain.
ECO 14.2: Identify database applications and their requirements.
ECO 14.3: Identify metadata requirements for geospatial data and products.
ECO 14.4: Apply appropriate security markings based on source product/data classifications.