GISCI GEOSPATIAL CORE TECHNICAL KNOWLEDGE EXAM ®
CANDIDATE MANUAL

July 2020

This document provides information about the GISCI Geospatial Core Technical Knowledge Exam ®, now a requirement for GISCI GISP Certification. For information about the GISP Certification Program, consult the GISCI website at www.gisci.org.

This document is updated prior to each exam window.

Exam Dates   Fall 2020 - Worldwide   - Dec 5-12, 2020

Application Period: North American locations: Until two weeks before exam starts
                International locations: Until two weeks before exam starts

Future Exams: Currently, exams are scheduled twice a year, in early June and December.

Exam Procedure

Submit Application.   Apply online at the GISCI website (www.gisci.org). Use your registration credentials.

Pay Application and Exam Fees. Once your Application Form is received you will be contacted with instructions for payment.
- **Application Fee.** The Exam Application Fee is one-time fee of $100.
- **Exam Fee.**
   o US and Canada: $250
   o International: $300

Schedule your exam date. You will receive email instruction from PSIOnline to schedule your exam.

Once you receive this notice, contact the test provider to schedule your specific exam date, time, and location. The exam will be offered at specific times at test facilities across the US. Exam times and seat capacity will vary among test facilities, so to ensure obtaining the most convenient location and time, you are encouraged to schedule your exam as soon as possible after you receive authorization.

Take the Exam. You must take the exam at the place and time arranged between you and the test provider (PSIOnline).

Receive Exam Results. You will receive your exam results from GISCI after we complete a full exam review. GISCI will review the exam scoring and send a final exam notification within three to four weeks of the exam close.

Extensions to the Procedure

- **Rescheduling.** You may contact PSI to reschedule your specific exam date at least 2 days prior to the exam date, without financial penalty, if there is space available.
- **Inability to schedule your specific exam date.** If you are authorized to take the exam, but do not schedule your specific exam date, you may receive a refund or transference of the Exam Fee upon request. (Contact the GISCI Executive Director.)
- **Postponement to a later exam event.** If you wish to take the exam at a later exam event, you must obtain authorization for that exam event. Your Exam Fee may be transferred to that event.
- **Failure to take your exam as scheduled.** If you schedule your exam and do not take it, the Exam Fee will may be refunded, depending upon circumstances. If you want to take the exam at a later event, you must obtain authorization for that date, and pay the Exam Fee for that date.
- **Exam failure and retake.**
  - If you fail the exam, you may take it again at the next exam event. You must obtain authorization for that future event.
  - If you fail the exam, you must pay the Exam Fee to take it again, and must obtain authorization for the exam event in which you plan to take it.
  - If you fail the exam twice, in back to back sessions, you must wait a year before taking the exam again.
  - You may not retake the exam in the same exam event.
- **Next exam.** The next GISCI Geospatial Core Technical Knowledge Exam ® has not been scheduled yet, but the current exam interval is approximately 6 months, with exam events scheduled in early June and December of each year. (Check the GISCI website www.gisci.org for future exam dates.)

Exam Location

- The exam will be offered through PSIOnline's testing centers worldwide.
- Once you receive your authorization, you may contact PSIOnline to schedule your exam date, time, and location.

Exam Description

- **Length.** The Fall 2020 exam will have between 175 - 195 questions, 100 of which are scored.
- **Time.** The time allowed for the exam is 4 hours.
- **Format:** The questions are Selected Response format.
- **Medium.** The exam will be offered via Computer Based Testing on the computers at the testing centers. Calculators will be provided, as necessary, on the testing center's computers.
- **Environment.** The exam will be proctored.
- **Language.** English.

Scoring

The exam contains two types of questions: multiple choice and multiple response. For these questions, select the one best answer from the list of options. The rest are multiple response. Each multiple response question ends with "Select all that apply." For these questions, select all of the correct answers from the list of options. There are at least two correct answers for each multiple response question.

Each question is scored as correct or incorrect, and all items have the same weight. Items with no response are scored as incorrect. Multiple response items must have all correct responses to be scored correct. Otherwise, they are scored as incorrect. No partial credit is given. The number of correct answers is totaled to determine the candidate's exam score.

Exam Content

Exam Foundation

The exam is based on a job analysis involving GIS professionals across all GIS job categories and sectors, with at least four years of GIS experience.

Core GIS Technical Knowledge

The exam tests core geospatial technical knowledge. Therefore, it does not address software details, specific environments, specialized knowledge, or management knowledge.

Exam Knowledge Areas

**The exam covers specific 45 Knowledge Areas** grouped into ten Categories, as indicated in the tables below.

GISCI Geospatial Core Technical Knowledge Exam ®

Knowledge Categories	Weight
1. Conceptual Foundations	10%
2. Geospatial Data Fundamentals	15%
3. Cartography and Visualization	10%
4. Data Acquisition	11%
5. Data Manipulation	11%
6. Analytical Methods	11%
7. Database Design and Management	10%
8. Application Development	7%
9. Systems Design and Management	7%
10. Professional Practice	8%
Total	_100%_

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1. Conceptual Foundations	
101	Understanding of datums, coordinate systems, and projections
102	Understanding of representation of discrete features and continuous phenomena in GIS
103	Knowledge of earth geometry and its approximations
104	Knowledge of basic geomatics and relationships to GIS

2. Geospatial Data Fundamentals	
201	Understanding of spatial data models and their associated planar geometries
202	Understanding of spatial data relationships
203	Understanding of data quality
204	Understanding of data resolution
205	Understanding of data validation and uncertainty
206	Understanding of metadata
207	Knowledge of temporal data
208	Knowledge of spatial data standards, including ISO, FGDC, and OGC

3. Cartography and Visualization

301	Understanding of graphic representation techniques and implications
302	Understanding of map design principles and essential map elements
303	Understanding of surface interpretation and representation
304	Understanding of 2D and 3D visualization

4. Data Acquisition

401	Understanding of digitization and other manual data collection and conversion methods
402	Knowledge of field data collection
403	Knowledge of automated data collection and conversion methods
404	Knowledge of remotely sensed data sources and collection methods
405	Knowledge of acquisition, use, and limitations of crowdsourced and open source data and services

5. Data Manipulation

501	Understanding of georeferencing, data format conversion, and data transformation
502	Understanding of spatial data generalization operations and methods
503	Understanding of spatial file types and their applications and limitations
504	Understanding of data integration

6. Analytical Methods

601	Understanding of data selection queries and views
602	Understanding of techniques and implications of data classification
603	Understanding of analytical operations and methods
604	Knowledge of map algebra
605	Knowledge of descriptive and spatial statistics

7. Database Design and Management

701	Understanding of relationships among database objects
702	Understanding of database design
703	Knowledge of database management and administration
704	Knowledge of data security

8. Application Development

801	Knowledge of data transfer protocols
802	Knowledge of coding, scripting, and modeling basics
803	Awareness of basic application development methods

9. Systems Design and Management	
901	Knowledge of systems architecture and design, including various GIS softwares, platforms, and environments
902	Knowledge of systems and application security
903	Awareness of trends in geospatial technology

10. Professional Practice	
1001	Understanding of appropriate interpretation of work-related policies and procedures
1002	Understanding of ethics related to technical GIS work
1003	Knowledge of managing, documenting, and communicating GIS work
1004	Awareness of how GIS is used across other professions
1005	Awareness of GIS-related professional organizations and certification

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Sample Questions

The following sample questions provide examples of the exam question format.   An answer key is provided at the end of the list of questions.

1) Which is an example of analog-to-digital conversion?
    a) Creating centroids from a polygon file
    b) Importing a DXF
    c) Scanning a map document to JPG format
    d) Transforming a GIF to a TIF

2) Which of the following is NOT a component of the OGC geometry object model?
    a) Chain
    b) Curve
    c) Point
    d) Surface

3) Which is the most effective method for maintaining data quality to ensure that no line features of a stream center line layer intersect the polygon feature of a land cover layer?
    a) Clip
    b) Intersect
    c) Overlay
    d) Topology

4) According to National Map Accuracy Standards, what percentage of features must be within 1/30 of an inch or less from their intended horizontal accuracy on maps with scales of 1:20,000 or larger?
    a) 5%
    b) 10%
    c) 90%

d) 95%

5) Which are compression techniques for raster data? Select all that apply.
   a) Lattice
   b) Pyramids
   c) Quadtrees
   d) Run length encoding

(ANSWER KEY: 1=c; 2=a; 3=d; 4=c; 5=c,d)

Study Resources

Resources that contain information related to the exam content are readily available in many forms. The following are examples of the types of materials that provide information regarding exam topics:

- GIS text books
- GIS compendiums and manuals (not software manuals)
- GIS courses
- GIS periodicals
- Cartography text books
- Cartography courses
- Geography text books
- Geography courses
- Statistics text books and courses
- GIS software supplier general GIS discussion (not software specific)
- General information technology and programming texts and courses

Any of the specific items in the above categories would provide relevant information. Therefore, GISCI is not providing specific titles and citations.

The exam assesses geospatial professional knowledge acquired over the course of an individual's geospatial education and career activities. It is expected that, for most candidates, study will involve refreshing their familiarity with some aspects of core geospatial knowledge that they may not have applied recently.

Practice Exam

A Practice Exam can be found on the GISCI website

https://www.gisci.org/Portals/0/PDF's/Practice%20Exam%201%20Mod.pdf

On the Day of the Exam

- Arrive at the testing center **30 minutes** in advance.

- Present a valid, government-recognized, unexpired, photo **ID** with your name as it appears on your exam authorization and scheduling. (Contact GISCI at least two weeks in advance if you need to make arrangements for another type of ID to be used, and bring that pre-approved ID to the test center.)
- **No personal items** are to be brought into the testing area.
- **No electronic devices** of any kind are allowed in the testing area.
- You are **not permitted to leave the building or use your cell phone or other electronic devices** during the exam.
- There is to be **no conversing** or other form of communication among candidates once you enter the testing area.
- **Persons not scheduled to take the exam are not permitted** to wait in the testing center or surrounding common area.
- Test takers must conduct themselves in a **professional and courteous** manner at all times.
- You are **prohibited from reproducing, communicating or transmitting any test content** in any form for any purpose. Any such actions are violations of PSI and GISCI security policy, and may result in the disqualification of exam results and/or lead to legal action.

Special Accommodations

All exam centers are equipped to provide access in accordance with the Americans with Disabilities Act (ADA) of 1990, and every reasonable accommodation will be made in meeting a candidate's needs. If you have special requirements, please contact GISCI at least 45 days before the exam date, so that suitable arrangements can be made.

Non-Discrimination

GISCI does not discriminate on the basis of race, religion, sex, age, sexual orientation, or national origin, or any other category that is protected by federal law or applicable laws and regulations.

Appeal of Results

Any appeals regarding exam results should be submitted to the GISCI Executive Director.