



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**INTRODUCTION TO GEOGRAPHIC INFORMATION
SYSTEMS
CIS1762 3 Credit Hours**

Student Level:

This course is open to students on the college level in either the Freshman or Sophomore year.

Catalog Description:

CIS1762 – INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (3 hrs)

This course will prepare students for the ArcGIS Desktop Entry certification. The topics will include geodatabases, layers, coordinate systems, table association, georeferencing, spatial adjustment, geocoding, feature geometries, attributes, topology, geoprocessing, table management, and map management.

Prerequisites:

None.

Co-requisites:

None

Controlling Purpose:

This course is designed to prepare students to work with the ArcGIS software. These concepts provide a foundation for further courses in geographic information systems and preparation for the ArcGIS Desktop Entry certification test.

Learner Outcomes:

Upon completion of the course, the student will be able to explain and use the basic components/tools of ArcGIS. The student will be able to create, analyze, and deliver components and maps to a variety of outputs.

Units Outcomes and Clock Hours of Instruction for Core Curriculum:

The following outline defines the minimum core content not including the final examination period. Instructors may add other material as time allows.

Evaluation Key:

A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same

- field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

UNIT 1: Geographic Data Storage Formats and Geodatabases						
Outcomes: Demonstrate knowledge of the geographic data storage formats and geodatabases components.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the geographic data storage formats
						List the types of geodatabases
						Define geodatabase tables
						Describe advanced geodatabase elements

UNIT 2: Managing Geographic Data						
Outcomes: Demonstrate the knowledge necessary to manage geographic data in a geodatabase including layering						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Add data to the geodatabase
						Create data from layers
						Layer source data

UNIT 3: Coordinate Systems and Evaluating Data						
Outcomes: Explain the different features of different coordinate systems and how data is managed in these systems						
A	B	C	D	F	N	Specific Competencies

						Demonstrate the ability to:
						Describe the types of coordinate systems
						Describe projection on the fly
						Contrast data in different projected coordinate systems
						Explain how to handle data with an unknown coordinate system
						Manage data in different geographic coordinate systems
						Evaluate data for a task
						Document data

UNIT 4: Associating Tables						
Outcomes: Describe how tables are related with software tools and the necessary design for table associations						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Define types of table relationships
						Create table associations
						Implement relationship classes

UNIT 5: Georeferencing and Spatial Adjustment						
Outcomes: Describe the techniques of defining raster data location using map coordinates and the assignment of the coordinate system of the data						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe georeferencing and spatial adjustment
						Implement georeferencing for raster data
						Use spatial adjustment tools to align and integrate data

UNIT 6: Geocoding						
Outcomes: Explain the purpose of geocoding and implement geocoding components and address matching						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Discuss and use geocoding components
						Implement address matching

						Identify the components of the geocoding environment
						Plan and use geocoding results

UNIT 7: Feature Geometries
 Outcomes: Use various tools to implement feature geometries including pre-defined geometries and creating new geometries

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Use feature templates
						Utilize feature construction tools
						Employ segment construction methods
						Create features from existing features
						Modify a feature shape
						Divide features into parts

UNIT 8: Attributes and Editing with Topology
 Outcomes: Explain how to create a new topology and perform editing using a topology and geodatabase topology

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Implement various attribute editing methods
						Perform calculations based on field geometries
						Use attribute editing with default values and domains
						Edit using topology and geodatabase topology

UNIT 9: Geoprocessing for Analysis
 Outcomes: Explain how to use geoprocessing tools and Python scripts for analysis

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Use geoprocessing tools for analysis
						Describe and implement geoprocessing models for analysis
						Use Python scripts for analysis

UNIT 10: Analyzing and Querying Tables

Outcomes: Explain how to analyze and query tables including attribute and spatial queries						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Extract information from attribute tables
						Implement attribute queries
						Implement spatial queries
						Use queries in analysis
						Work with selections

UNIT 11: Performing Spatial Analysis						
Outcomes: Explain how to perform spatial analysis using proximity analysis, overlay analysis, and temporal analysis						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe and implement proximity analysis
						Explain and implement overlay analysis
						Define and use statistical analysis
						Describe and implement temporal analysis

UNIT 12: Layers						
Outcomes: Explain the usage of layers in map design along with proper design of layers to manage large amounts of data						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Work with layers and data frames
						Explain and implement vector layer symbology and raster layer symbology
						Manage the amount of data viewed in a map

UNIT 13: Map Management						
Outcomes: Explain the components necessary to deliver a map to different outputs including the web, service, and packaging						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Compose a map layout

						Create a graph
						Describe the index layer
						Enable and refine data driven pages
						Create map text and symbols
						Optimize maps for the web
						Share a map as a service
						Prepare temporal data for a web map
						Export and print maps
						Share maps and data through packaging
						Share map documents

Projects Required:

Varies, refer to syllabus.

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

None

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Time Frame:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class and which requires accommodations, contact the Disability Services Coordinator.