

Course Number and Title: GIS 210 Cartographic Design and Visualization

Campus Location:

Stanton

Effective Date:

2022-51

Prerequisite:

GIS 110, GIS 120

Co-Requisites:

None

Course Credits and Hours:

3.00 credits

2.00 lecture hours/week

3.00 lab hours/week

Course Description:

This course introduces fundamental cartographic concepts. Emphasis is placed on design principles necessary to create and edit effective visual representations of data in different formats. Topics include the ethical and appropriate application of map scale, map projections, generalization, and symbolization.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

This course requires the use of a windows computer capable of running ESRI ArcMap and ESRI ArcGIS Pro Software. Please review ESRI's website to learn more about the system requirements for ESRI ArcMap and ESRI ArcGIS Pro

Schedule Type:

Classroom Course

Hybrid Course

Online Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Categorize different types of maps and their various components. (CCC 2, 4; PGC 2, 4, 7)
2. Employ an appropriate geographic referencing system for a given purpose. (CCC 4, 6; PGC 1, 2, 3, 5, 7, 8)
3. Select ethical and appropriate data visualization techniques. (CCC 4, 5, 6; PGC 1, 2, 3, 7)
4. Design professional, quality maps that employ cartographic principles in a variety of formats. (CCC 2, 4, 5; PGC 1, 2, 3, 7)
5. Critique maps for appropriate use of cartographic design principles. (CCC 1, 3, 4, 6; PGC 2, 7)
6. Demonstrate professional and ethical conduct as expected in industry. (CCC 4; PGC 2, 7, 8)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Categorize different types of maps and their various components.
 1. Describe different types of maps, such as thematic and reference maps, and give examples of how each is used.
 2. Review the history of cartography and how GIS is used to create maps.
 3. Describe how cartography can support visual thinking and visual communication.
 4. Discuss the components of a map, and explain how they differ with map type.
 5. Select and employ appropriate map elements for different types of maps and audiences.
2. Employ an appropriate geographic referencing system for a given purpose.
 1. Identify a variety of commonly used geographic reference systems.
 2. Describe the various projection classes and their properties and distortions.
 3. Discuss how different map projections, coordinate systems, and datums can affect map design and accuracy of map products.
 4. Illustrate the use of coordinate system transformations.
 5. Employ appropriate geographic reference system parameters.
3. Select ethical and appropriate data visualization techniques.
 1. Give examples of various data visualization techniques, such as maps, graphs, charts, and diagrams.
 2. Identify characteristics of the following map elements: map symbols, visual variables, and color.
 3. Discuss proper applications of map elements such as map symbols, visual variables, and color.
 4. Outline ethical considerations in data visualization.
 5. Discuss ways to visually represent data uncertainty.
 6. Recognize the impact audience plays in the selection of visualization methods.
 7. Apply visual variables that are more appropriate for different data classification methods.
 8. Apply methods to symbolize point, line, and polygon features that fit the data.
 9. Apply methods to represent surfaces such as elevation and other continuous, smoothly changing data.
 10. Identify and employ methods to represent multiple variables.
 11. Apply appropriate data visualization techniques that accurately and effectively communicate the desired information for different data types.
4. Design professional, quality maps that employ cartographic principles in a variety of formats.
 1. Describe cartographic principles such as visual contrast, legibility, figure-ground, hierarchy and balance; and explain how they work together to communicate geographic information.
 2. Discuss differences in producing maps in a variety of formats, such as hardcopy, digital, and web.
 3. Identify design elements such as placement, color scheme, size, and typography.
 4. Employ design elements that create appropriate visual hierarchy.
 5. Select appropriate types of output formats, and produce maps using that format.
 6. Design layouts using visual hierarchy, balance, and figure-ground of text and graphics to quickly communicate the subject and purpose of a variety of output formats and map types (such as choropleth map, dot density map, and proportional symbol map).
5. Critique maps for appropriate use of cartographic design principles and data visualization techniques.
 1. Recognize use of cartographic design principles and data visualization techniques when viewing maps.
 2. Discuss how different design and visualization choices may change the appearance of a map.
 3. Examine cartographic design principles and data visualization techniques of various maps through peer review.
6. Demonstrate professional and ethical conduct as expected in industry.
 1. Identify the need for self-discipline and time management in technical industries.
 2. Communicate and function effectively as a member of a team.
 3. Apply professional and ethical responsibilities under the GIS Certification Institute's Code of Ethics and Rules of Conduct.

Evaluation Criteria/Policies:

The grade will be determined using the Delaware Tech grading system:

90	-	100	=	A
80	-	89	=	B
70	-	79	=	C
0	-	69	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Final Course Grade:

Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Exams: 2-4 equally weighted (Summative)	10%
ESRI Desktop Entry Level Certification Exam (Summative)	5%
Final Project Proposal (Summative)	10%
Final Project (Summative)	20%
Final Project Presentation (Summative)	10%
Final Project Presentation Peer Critique (Summative)	10%
Assignments – Labs, Lab Critiques, Homework, In-Class Activities, Discussion Boards (Formative)	35%
TOTAL	100%

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Apply knowledge, techniques and skills of geography and geospatial technologies such as geographic information systems (GIS), Global Navigation Satellite System (GNSS), and remote sensing (RS).
2. Employ cartographic design principles to develop effective visual representations of geospatial data, including maps, graphs and diagrams.
3. Design and implement GIS systems using common geospatial software and hardware to acquire, store, manage, analyze and visualize spatial data for a variety of disciplines.
4. Utilize geospatial techniques and common analytical methods to solve problems.
5. Evaluate and employ effective data management and database design techniques.
6. Apply fundamental concepts of programming, application development, geospatial information technology and related technologies.
7. Integrate a commitment to address professional and ethical responsibilities, including a respect for accuracy standards and diversity.
8. Recognize the need for and an ability to engage in self-directed continuing professional development.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.