



GIS 204: *Cartographic Design*

Fall 2022: 27 August – 13 December 2023: Online, Asynchronous

Instructor Contact Information

GIS 204	
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For refund information, please visit

<https://www.hacc.edu/Students/RegisterOnlineGuide/add-and-drop-deadlines.cfm>

Course Information

Course Description: Through this course, you will apply the fundamental concepts of cartographic design. This course empowers students to utilize design principles to create and edit effective visual representations of data (e.g. maps, graphs, and diagrams) in different formats (e.g. hardcopy, digital, web). Specific topics include the ethical and appropriate application of map scale, map projections, generalization, and symbolization. Through a series of readings, videos, and hands-on activities covering

a variety of themes, issues, and scales, you will learn the fundamentals of modern cartography and how to effectively communicate with spatial data and tools. You will build your own maps, web mapping applications including story maps, dashboards, infographics, and more.

This course is completely online and asynchronous. However, to foster community and networking, you are strongly encouraged to work through the course in step with your classmates; that is, completing Week 1 content *sometime during* Week 1, completing Week 2 content *sometime during* Week 2, and so on. Choose your coursework time that best fits your schedule. We will also hold occasional live office hours in Zoom, as needed. This is a 3 credit course; therefore, plan to spend at least 5 hours each week working through the readings, videos, activities, and quizzes.

Course Learning Outcomes

1. Describe the components of a map (map elements).
2. Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for **communication of issues, events, or themes, and for solving problems.**
3. Apply **cartographic design** principles such as symbology, color, projection, and classification methods to create, modify, and share maps.
4. Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.
5. Critically evaluate **maps and visualizations.**
6. **Design professional quality maps,** including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.
7. Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).
8. Identify **how society influences mapping, and how mapping influences society,** through the representation of data through mapping.

Course Purpose and Expectations

The purpose of this course is to lay a firm foundation for your successful use of GIS for creating maps and visualizations by introducing you to the ways that digital maps from GIS can be created, symbolized, and used cartographically to solve problems and serve as communication tools in a wide variety of fields—health, engineering, environmental science, public safety, city planning, data science, business, and many more. Through this course, you will gain fundamental skills in cartography through hands-on work. But equally importantly, you will gain understanding of the technological and societal implications that these tools have on 21st Century society and how you can chart your own pathway forward using these tools and perspectives.

Prerequisites

This course has 1 prerequisite so that you will have a solid foundation behind you as you work forward in this course: **GIS 141 Introduction to Geospatial Technology.**

The other items necessary for course success are: (1) A desire to learn, an inquisitive mind, and (2) a desire to be a positive change agent in the world 😊. It is advisable also for you to be comfortable with operating a web browser, understanding the difference between file types (DOCX, JPG, XLSX), and be comfortable with managing files and folders on your own device (laptop).

Required Texts and Materials

Given the rapidly evolving nature of GIS, there is no suitable required text for this course. However, there **are** required readings and videos for this course, which are given in sequential order as follows:

Videos

You will be watching and reflecting upon a set of 1 to 3 short videos each week.

Readings and Discussions

In your overview in the Learning Management System (Brightspace) for this course, you will find a main set of readings for each week. There are 15 sets of readings total, one set of each week. Videos are sometimes embedded within these readings. Please promptly inform your instructor if you are not able to open any content. Labs (hands-on work with GIS and maps) build on the reading content of each module and allow you to work in a problem-solving mode with the topics raised in the readings. Therefore, it is recommended to work through the readings first before completing the hands on activities for each week. At the end of each week's readings, you will be asked a short set of questions to respond to in discussion mode so that we can all be learning from each other.

References

You will be provided with a reference list of articles and other resources in this course. Feel free to explore these as you have time, or even after this course ends, to keep learning and moving forward. You won't be graded on any of these outside readings unless they are included in the main readings for each week.

Labs (Hands-on Activities) and Discussions

Maps and geo-visualizations are inherently so compelling, so visual, and so perfect for addressing real issues in our world (from population to water, from energy to health, and more) that each week you will have the opportunity to work with data, tools, and maps to address these issues. At the end of each hands-on lab, you will be presented with a short set of questions to respond to in a discussion. You will often be asked to share the URLs of the maps you create in this courses so everyone can learn from your work.

Quizzes

At the end of each week, you will have the opportunity to take a short quiz of 6 questions. Rather than thinking of these as items you need to spend a block of time preparing for, use these as an opportunity for self-assessment, to gauge how much you are learning and moving forward.

Course Policies

Technology Requirements

You will need:

1) Software:

(1a) Software: Access to Microsoft Office software (Word and Excel) for completion of selected assignments (or the ability to export a DOCX file via Open Office or Google Docs).

(1b) ArcGIS Online (www.arcgis.com). This is 1 of 2 main GIS software sets for this course. ArcGIS Online, as the name implies, runs completely online on the web and requires nothing to be installed on your local device. Most of the activities using ArcGIS Online in this course requires a sign in and for you to have creator/publisher role within the ArcGIS Online organizational account. The HACC ArcGIS Online administrator will invite you to join this organizational account by the time the course begins. You will sign in to www.arcgis.com and you will be a named user in that organizational account. Many of the maps, web mapping applications (such as story maps), and spatial data that you create will be stored in this ArcGIS Online account. You will also be creating some ArcGIS Pro projects and will take screen shots from those and/or sharing them to your ArcGIS Online HACC organizational account.

(1c) ArcGIS Pro version 3.1. This is #2 of our 2 main GIS software sets for this course. ArcGIS Pro requires a download from the HACC system and runs on your local computer. While you are using ArcGIS Pro, to take full advantages of cloud based GIS, you ideally will be signed in to your ArcGIS Online account. ArcGIS Pro runs natively on Windows OS. If you have a Mac, you will need to use virtualization software. To install ArcGIS Pro, see notes in the course learning management system.

(1d) We will use other mapping tools besides ArcGIS Online and ArcGIS Pro occasionally in the course as well, such as WorldMapper cartograms and assorted others. These tools will all run in a web browser requiring no sign in or installation of software.

2) Hardware:

(2a) Access to a computer (laptop). A tablet such as a Chromebook or iPad will only allow you to be successful only with a small fraction of this course and thus will not be suitable for this course.

(2b) A smartphone for collecting data in the field in your own area that you will map and analyze.

3) A broadband connection to the Internet.

Class Participation

While there are no face-to-face class sessions, key to success in the use of GIS is networking and peer-to-peer interaction. Therefore, full and collegial participation is required for student success in the course. An “absence” is a gap in a student’s full participation that results in her/his completing less than 50% of the required activities for that week, or a lack of participation in the discussion forums for entire week. Your instructor is here to help you to succeed, so keep the lines of communication open.

In online courses such as this, your regular participation is the equivalent of coming to a class held on campus. Participation involves logging in to our course, navigating through the content pages in a module, completing the readings and videos, participating in discussions and other activities, and submitting assignments/quizzes/exams. Your participation is not only an important part of your learning, it will also contribute to the learning of your peers. As members of our learning community, each of us has a responsibility to create an environment in which we can all learn from each other.

According to guidance from the federal Department of Education, HACC must demonstrate that an online student participated in class or was otherwise engaged in an academically-related activity for attendance purposes. Logging into an online class without active participation does not meet their definition of attendance. Examples of academic activities in this class include, but are not limited to, the following:

- Submitting an assignment
- Taking a quiz or exam
- Initiating contact with the faculty member to ask a question about the academic subject being studied in the course

Withdrawal Policy

No grade will be given to students who withdraw during the refund period. A student who fails to attend class the first two weeks will be dropped at the end of that time. Students can drop or withdraw from a course and receive a “W” status any time after the refund period has ended and prior to the completion of 70% of instruction time for the part of term. The link to refund dates and additional information is <https://www.hacc.edu/Students/RegisterOnlineGuide/add-and-drop-deadlines.cfm>.

A “W” will be granted for students who withdraw if the following conditions are met:

- The student requests the withdrawal
- The student has made an attempt to complete the work
- The student has upheld the policy for academic honesty

An “F” will be assigned if the student does not request a withdrawal, does not complete the course work, or does not uphold the academic honesty policy.

Late Assignments Policy

This course spans a wide and expanding field—cartography and GIS, and is one semester long. Therefore it is especially critical that you turn your work in each week as appropriate. In general, assignments turned in late will be subject to a 10% reduction in points so long as they are turned in no longer than 2 weeks past the due date. This policy may be waived in case of personal emergency and accommodating COVID issues, but *it is your responsibility* to notify your instructor and request an extension.

Course and Instructor Evaluations

At the conclusion of every HACC course, you will be asked to evaluate the course and instruction that you experienced. Providing feedback through course evaluations is an important responsibility for every student, and the process is entirely anonymous and secure. I as your instructor will not have access to course evaluations until after grades are submitted. I take those evaluations seriously and I use them to help me improve future offerings of this course and to help me become a better instructor for other courses. I and other faculty members use course evaluations to improve teaching effectiveness, to revise courses, and to evaluate the program. Course evaluations are also considered in the hiring, retention, promotion, and tenure of faculty members.

Academic Integrity

HACC is committed to the highest possible ethical standards. Just as we will strive to live up to these high standards, we expect our students to do the same. To that end, cheating of any sort will not be tolerated. Students who are discovered cheating are subject to discipline up to and including failure of a course and expulsion. Cheating includes but is not limited to: 1. Plagiarism – the use of another’s work as one’s own without giving credit to the individual. This includes using materials from the internet. 2. Copying another’s answers on an examination. This includes copying and pasting answers from a website (i.e. Wikipedia) into your quizzes without proper attribution. 3. Deliberately allowing another to copy one’s answers or work.

Academic Dishonesty is defined in SGP 594. A partial description of this procedure is given below.

“Academic dishonesty is defined as an intentional act of deception in which a student seeks to claim credit for the work or effort of another person, or uses unauthorized material or fabricated information in any academic work.” It includes, but is not limited to:

- A. Cheating - giving or receiving answers on assigned material, using materials or aids forbidden by the instructor ... unauthorized possession of examinations....
- B. Plagiarism - offering someone else's work, words, or ideas as one's own or using material from another source without acknowledgement.
- C. Interference – interfering without permission with the work of another student, either by obtaining, changing or destroying the work of another student.
- D. Buying or selling of term papers, homework, exams, lab assignments, computer programs, etc.
- E. Falsifying of one's own or another's records

- F. Knowingly assisting someone who engages in A - E above.

Penalties for students found to have committed academic dishonesty include, but may not be limited to, the following:

- A. Lowering of a grade or failure for a particular assignment,
- B. Lowering of a grade, failure, and/or dismissal from the course.
- C. Disciplinary probation-may include a limitation on credits, mandatory repeat of a course, etc.
- D. Suspension from a curriculum.
- E. Suspension from the College

If academic dishonesty occurs in this class, a grade of 0 will be assigned for the item in question. A second violation will result in an automatic grade of 'F' for the course.

Assessment of Student Learning

Assessment of student learning outcomes for the course, as required by the Shared Governance Policy – Assessing Institutional Effectiveness, is part of regular curriculum maintenance and/or improvement. The specific plan has been determined by the pertinent faculty involved and is maintained in the College’s assessment management system.

A student's grade is based on multiple measures of performance. These measures include the following: 1. Discussion and reflections on readings and videos. 2. Responding to questions about hands-on activities. 3. Quizzes. 4. Final Exam. 5. Implementation plan.

Readings Discussions:	15 discussions x 1 points each =	15 points
Activities:	15 activities x 3 points each =	45 points
Quizzes:	15 quizzes (each is 6 questions) x 2 points each =	30 points
Final Project	1 project x 10 points =	10 points
Total:		100 points

Grading Rubrics: For each type of assignment, a grading rubric has been developed. The weekly **discussion** rubric is as follows:

Category	1 Point	.5 Point	0 Points
Discussion quantity	At least 1 original discussion post and 1 reply to another student’s discussion is posted.	Only 1 original discussion is posted or 1 reply to another student’s discussion is posted, but not both.	No discussion is posted.
Discussion quality	Discussion posts are substantive and relate to key principles of the assignment.	Discussion posts are generally short phrases demonstrating that the readings have only been skimmed and/or not much effort is made.	No discussion is posted.

The weekly **hands-on activities** rubric is as follows:

Category	3 Points	2 Points	1 point	0 Points
Key Principles	Questions are answered with evidence that the principles have been understood.	Only some questions are answered with evidence that the principles have been understood.	Few questions are answered with evidence that the principles have been understood.	No questions are answered.
Skills	Maps are created, visualizations constructed, and analysis conducted with sufficient evidence that the necessary skills have been acquired.	Maps are created, visualizations constructed, and analysis conducted with only some evidence that the necessary skills have been acquired.	Most maps are created, visualizations constructed, and analysis conducted with no evidence that the necessary skills have been acquired.	No maps or visualizations are created.

The weekly **quiz** rubric is as follows:

Category	2 Points	1 Point	0 Points
Quiz results	Questions are answered with understanding of the fundamentals of cartographic design. All quiz answers are correct.	Only some questions are answered with understanding of the fundamentals of cartographic design; and/or some quiz answers are incorrect.	No questions are answered with evidence of understanding of the fundamentals of cartographic design; none of the quiz answers are correct.

The course **final project** rubric is as follows:

Category	10 Points	6 Points	0 Points
Final Project	A final project incorporating all of the required map elements and references is provided.	A final project incorporating only some of the required map elements and references is provided..	A final project incorporating none of the required map elements and references is provided.

Grading Scale

The following table shows how point percentages for the course correspond to the standard grades used at HACC. For more information, see: <https://www.hacc.edu/Students/AdvisingCounseling/GPA-Calculators.cfm>

Course Percentage	Letter Grade	
90-100%	A	

80-89%	B	
70-79%	C	
60-69%	D	
0-59.9%	F	

Weekly Course Outline and Checklist. Feel free to use this to keep track of your progress.

Week	Readings and Videos	Readings Discussions	Lab Discussions and Quizzes
1	Readings <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 1 <input type="checkbox"/>	Lab Discussion 1 <input type="checkbox"/> Quiz 1 <input type="checkbox"/>
2	Readings <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 2 <input type="checkbox"/>	Lab Dropbox 2 <input type="checkbox"/> Quiz 2 <input type="checkbox"/>
3	Readings <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 3 <input type="checkbox"/>	Lab Discussion 3 <input type="checkbox"/> Quiz 3 <input type="checkbox"/>
4	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 4 <input type="checkbox"/>	Lab Discussion 4 <input type="checkbox"/> Quiz 4 <input type="checkbox"/>
5	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 5 <input type="checkbox"/>	Lab Discussion 5 <input type="checkbox"/> Quiz 5 <input type="checkbox"/>
6	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 6 <input type="checkbox"/>	Lab Discussion 6 <input type="checkbox"/> Quiz 6 <input type="checkbox"/>
7	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 7 <input type="checkbox"/>	Lab Discussion 7 <input type="checkbox"/> Quiz 7 <input type="checkbox"/>
8	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 8 <input type="checkbox"/>	Lab Discussion 8 <input type="checkbox"/> Quiz 8 <input type="checkbox"/>
9	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 9 <input type="checkbox"/>	Lab Discussion 9 <input type="checkbox"/> Quiz 9 <input type="checkbox"/>
10	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 10 <input type="checkbox"/>	Lab Discussion 10 <input type="checkbox"/> Quiz 10 <input type="checkbox"/>
11	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 11 <input type="checkbox"/>	Lab Discussion 11 <input type="checkbox"/> Quiz 11 <input type="checkbox"/>
12	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 12 <input type="checkbox"/>	Lab Discussion 12 <input type="checkbox"/> Quiz 12 <input type="checkbox"/>
13	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 13 <input type="checkbox"/>	Lab Discussion 13 <input type="checkbox"/> Quiz 13 <input type="checkbox"/>
14	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 14 <input type="checkbox"/>	Lab Discussion 14 <input type="checkbox"/> Quiz 14 <input type="checkbox"/>
15	Readings: <input type="checkbox"/> Videos: <input type="checkbox"/>	Readings Discussion 15 <input type="checkbox"/>	Lab Discussion 15 <input type="checkbox"/> Quiz 15 <input type="checkbox"/>
16		Finish all remaining work in the course.	Final Project <input type="checkbox"/>

Weekly Course Themes

Week 1:	27 Aug – 2 Sep:	What is a map? Why do maps matter?
Week 2:	3-9 Sep:	Representing Data.
Week 3:	10-16 Sep:	Space, Place, and Time.
Week 4:	17-23 Sep:	Spatial Analysis and Spatial Statistics.
Week 5:	24-30:	Map Elements: Color, Type, Symbols.
Week 6:	1-7 Oct:	Generalization and Classification.
Week 7:	8-14 Oct:	Choropleth and Proportional Symbols Maps, Labels, Charts, More.
Week 8:	15-21 Oct: (Fall break 16-17):	Dot density, flow, cartograms, and cartographic design.
Week 9:	22-28 Oct:	Deeper Dive into Symbols and Design.
Week 10:	29 Oct – 4 Nov	Data Quality, Uncertainty, Ethics.
Week 11:	5-11 Nov:	Mapping Imagery.
Week 12:	12-18 Nov:	Surfaces and 3D mapping.
Week 13:	19-25 Nov: (Thanksgiving 23-24):	Mapping Field data and Communicating With Maps.
Week 14:	26 Nov – 2 Dec:	The future is Now: UAVs, Lidar, Big Data, BIM, More.
Week 15:	3-9 Dec:	Project Work.
Week 16:	10-16 Dec:	Finish all work; turn in Final Project.

Each week, you will learn **core content**, develop a set of **technical skills**, grapple with a **societal issue** associated with cartographic design, and reflect upon your **own learning**.

Detailed Course Plan: Topics

Week	Course Learning Outcomes	Readings and Videos	Hands-on Activities
Week 1: What is a map? Why do maps matter?	<p>#1 Describe the components of a map (map elements).</p> <p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>	<p>Andy Woodruff's Maps.</p> <p>What is a map? What is GIS? Why maps?</p> <p>Maps as Decision Making Tools.</p> <p>Components of GIS.</p> <p>Defining GIS. GIS is Changing. GIS answers questions.</p> <p>GIS Data.</p> <p>Spatial Technology: A Platform. Different terms, same technology, always about where.</p> <p>GIS in your own career pathway.</p> <p>It's all about the relationships. The Whys of Where.</p>	<p>Examining business locations.</p> <p>Think bigger picture.</p> <p>Mapping other businesses.</p> <p>Be critical of data—including maps.</p> <p>A business web mapping application.</p> <p>A web mapping application: The urban observatory.</p> <p>Investigate population trends and population pyramids from NASA SEDAC Population viewer.</p> <p>Investigate the International Migration Web Mapping Application.</p> <p>Examining the world's water balance.</p>

Week	Course Learning Outcomes	Readings and Videos	Hands-on Activities
		<p>Critical Thinking. Earth Changes and Spatial Technology.</p> <p>A brief History of GIS in society. On to the web!</p> <p>Why is this the ideal time for you to be using GIS in your career?</p> <p>Let's explore some maps made with GIS!</p> <p>The geospatial technology competency model. Examining 1 GIS focused position.</p> <p>Defining a map. Types of maps.</p>	
<p>Week 2: Representing Data</p>	<p>#1 Describe the components of a map (map elements).</p> <p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>	<p>2.1. GIS Data.</p> <p>2.2. GIS and cartography are fundamental to understanding our world.</p> <p>2.3. What is geoliteracy?</p> <p>2.4 Geospatial Data.</p> <p>2.5 Major types of geospatial data.</p> <p>2.6. Data portals.</p> <p>2.7. Geospatial Data challenges.</p> <p>2.8. GIS data formats and files.</p> <p>2.9. GIS software and tools.</p>	<p>2.1. Making cartographic choices when Representing Extreme Temperatures.</p> <p>2.2. Cartographic representations of population data</p> <p>2.3. Cartographic representation of small-area demographics by polygon.</p> <p>2.4. Web maps vs. web mapping applications.</p> <p>2.5. Cartographic representations of data as services.</p>
<p>Week 3: Space, Place, and Time.</p>	<p>#1 Describe the components of a map (map elements).</p> <p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p>	<p>3.1 Space, Place, and Time.</p> <p>3.2 Location.</p> <p>3.3. Scale.</p> <p>3.4. Representing Time</p> <p>3.5. Geodesy and Coordinate Systems.</p> <p>3.6. Map Projections.</p>	<p>3.1. Memory Maps.</p> <p>3.2. Mapping Time.</p> <p>3.3. Mapping Isolines</p> <p>3.4. Analyzing Change with Web Mapping Applications.</p> <p>3.5. Querying on temporal data and mapping imagery.</p>

Week	Course Learning Outcomes	Readings and Videos	Hands-on Activities
	<p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>		
<p>Week 4: Spatial Analysis and Spatial Statistics.</p>	<p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p>	<p>4.1. Topology 4.2. Spatial Analysis. 4.3. Spatial Statistics. 4.4. Let's examine some additional maps. 4.5. Examining additional basemaps.</p>	<p>4.1. Spatial Analysis: Trace Downstream. 4.2. Spatial Statistics: Mean Geographic Center and Standard Deviation Ellipse</p>
<p>Week 5: Map Elements: Color, Type, Symbols.</p>	<p>#1 Describe the components of a map (map elements).</p> <p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p>	<p>5.1. Color. 5.2. Blending. 5.3. Symbols 5.4. Reference Features 5.5. Legend Design 5.6. Introduction to Typography.</p>	<p>5.1. Analyzing color choices with ColorBrewer. 5.2. Point Mapping. 5.3. Color and Symbology: Raw numbers, ratio, relationship maps. 5.4. Labeling Features. 5.5. Blending.</p>
<p>Week 6: Generalization and Classification.</p>	<p>#1 Describe the components of a map (map elements).</p>	<p>6.1. Generalization. 6.2. Methods of generalization.</p>	<p>6.1. Symbology and Classification on Vector Layers</p>

Week	Course Learning Outcomes	Readings and Videos	Hands-on Activities
	<p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>	<p>6.3. Classification.</p> <p>6.4. Classification and Color.</p> <p>6.5. The number of classes.</p> <p>6.6. Aggregation, Classification, and the Ecological fallacy</p> <p>6.7. Intentional Misrepresentations on Maps.</p>	<p>6.2. Symbology and Classification on Image Layers.</p> <p>6.3. Generalization.</p>
Week 7: Choropleth and Proportional Symbols Maps, Labels, Charts, and More.	<p>#1 Describe the components of a map (map elements).</p> <p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p>	<p>7.1. Thematic Maps.</p> <p>7.2. Why create a choropleth map?</p> <p>7.3. Bivariate Maps.</p> <p>7.4. Diagrams.</p>	<p>7.1. Cartography with USA Tornadoes data in ArcGIS Online.</p> <p>7.2. Cartography using Singapore places of interest in ArcGIS Pro.</p>
Week 8: Dot density, Flow, Cartograms, and Cartographic Design.	<p>#1 Describe the components of a map (map elements).</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p>	<p>8.1. Dot Density Maps.</p> <p>8.2. Flow maps.</p> <p>8.3. Cartograms.</p> <p>8.4. Map Layouts.</p>	<p>8.1. Examining and Making Dot Density maps.</p> <p>8.2 Making Flow maps.</p> <p>8.3 Examining and Creating Cartograms.</p> <p>8.4. Creating a Map Layout.</p>

Week	Course Learning Outcomes	Readings and Videos	Hands-on Activities
Week 9: Deeper Dive into Symbols and Design.	<p>#1 Describe the components of a map (map elements).</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p>	<p>9.1. Symbolization: A deeper dive.</p> <p>9.2. A Deeper Dive into Design</p> <p>9.3. Design as Planning and Building.</p> <p>9.4. Design as the Final Map Product</p> <p>9.5. Design as the Organization of a Map</p> <p>9.6. Design Subsets</p> <p>9.7. Difference from Design</p> <p>9.8. Style</p> <p>9.9. Pastiche</p> <p>9.10. Emotional Impact</p> <p>9.11. Taste</p> <p>9.12. Design and Critique.</p>	<p>9.1. Creating and symbolizing a thematic map in ArcGIS Pro.</p>
Week 10: Data Quality, Uncertainty, Ethics.	<p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>	<p>10.1. Data Quality.</p> <p>10.2. Ethics in Cartography.</p> <p>10.3. Location Privacy.</p>	<p>10.1. Location Privacy: Fitness apps and high-resolution images.</p> <p>10.2. Mapping Uncertainty: Ecoregion Boundaries.</p> <p>10.3. Mapping Uncertainty: Tornado Tracks.</p>
Week 11: Mapping Imagery.	<p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p>	<p>11.1. Representing Imagery.</p> <p>11.2. Audience.</p> <p>11.3. Usability.</p>	<p>11.1. Representing Imagery with the Landsat Lens Viewer.</p> <p>11.2. Representing imagery with another web mapping application: Landsat Explorer.</p>

Week	Course Learning Outcomes	Readings and Videos	Hands-on Activities
	<p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>		
Week 12: Surfaces and 3D Mapping.	<p>#1 Describe the components of a map (map elements).</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>	<p>12.1. Isoline Maps.</p> <p>12.2. Interpolation methods.</p> <p>12.3. Color choices.</p> <p>12.4. Isarithmic maps.</p> <p>12.5. 3D maps and visualizations.</p>	<p>12.1. Mapping Isolines.</p> <p>12.2. 3D Globes</p> <p>12.3. Examining existing 3D scenes.</p> <p>12.4. Modify an existing 3D scene.</p>
Week 13: Mapping Field Data and Communicating With Maps.	<p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 5 Critically evaluate maps and visualizations.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>	<p>13.1. Geo-awareness.</p> <p>13.2. Geo-enablement.</p> <p>13.3. Geotechnologies.</p> <p>13.4. Citizen Science.</p> <p>13.5. Storytelling.</p> <p>13.6. Geoliteracy.</p> <p>13.7. 5 Trends in Cartography and GIS.</p> <p>13.8. Multimedia Cartographic Means of Communication: Infographics, Story Maps, and Dashboards.</p> <p>13.9. Connecting communications apps.</p> <p>13.10. Let's examine some more maps! Library of Congress.</p>	<p>13.1. Creating a Dashboard in ArcGIS Online.</p> <p>13.2. Visualizing the expansion of public transportation in ArcGIS Pro.</p>
Week 14: The future is Now: UAVs, Lidar, Big Data, BIM, More.	<p>#2 Identify ways in which GIS, maps, and geo-visualizations are providing a common language and framework for communication of issues, events, or themes, and for solving problems.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively</p>	<p>14.1. Future Directions in Cartography.</p> <p>14.2. New types of visualizations: Dashboards.</p> <p>14.3. High Resolution Imagery, Smaller Satellites, Do-It-Yourself imagery.</p> <p>14.4. Lidar data.</p> <p>14.5. Real time data feeds.</p>	<p>14.1. Mapping the Oceans.</p> <p>14.2. Mapping Mars.</p> <p>14.3. Work on your final project.</p>

Week	Course Learning Outcomes	Readings and Videos	Hands-on Activities
	<p>communicate quantitative and qualitative geographic data.</p> <p># 8 Identify how society influences mapping, and how mapping influences society, through the representation of data through mapping.</p>	<p>14.6. More transportation applications. 14.7. Global Applications.</p> <p>14.8. Big Data 14.9. Interior Spaces. 14.10. Artificial Intelligence. 14.11. Maps, Visualizations, Art. 14.12. New Fields and Study Programs for Cartography and GIS.</p> <p>14.13. GIS is a Platform. 14.14. Consider what's next. 14.15. Inspiring people.</p>	
Week 15: Work on final project.	<p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p>	15.1. Keep learning!	Final Project.
Week 16: Final Exam and Finish all work.	<p>#3 Apply cartographic design principles such as symbology, color, projection, and classification methods to create, modify, and share maps.</p> <p># 4 Select and apply ethical and appropriate data model, map scale, map elements, symbolization, and color to produce maps that effectively communicate quantitative and qualitative geographic data.</p> <p># 6 Design professional quality maps, including map elements such as text, graphs, charts, images, and diagrams, employing cartographic principles.</p> <p># 7 Create maps, 3D scenes, and related content in a variety of formats (hard copy, digital, and web).</p>		Final Project.

The Learning Commons

The Learning Commons is a hub for academic support and connection to vital resources and services. It includes the following four areas: • Tutoring | • Library | • Tech/User Support | • Testing

The Learning Commons is a one-stop shop for your academic support needs. It has a physical presence at all five campuses and also offers robust online services to meet a variety of student needs. No matter how you access

services or what kinds of projects you're working on, the Learning Commons can help you reach your academic goals through access to resources and research instruction, technology integration, testing needs, and tutoring for that extra boost. The Learning Commons includes the library, testing, tutoring, and user support.

To access the Learning Commons, please visit: <https://libguides.hacc.edu/learningcommons>

Students in Need of Mental Health Counseling:

HACC has entered into a contract with Mazzitti & Sullivan EAP Services to provide mental health counseling services to our students. Mazzitti & Sullivan has over 3,000 providers nationwide who are able to assist individuals in need of mental health or drug/alcohol counseling. Interested students are encouraged to contact Mazzitti & Sullivan EAP Services at 1-800-543-5080.

Diversity, Inclusion and Student Choice:

Diversity is more than someone's ethnic background—it includes life experiences, disabilities, religion (or lack thereof), sexual orientation, language, and many more aspects. In this class and throughout the institution, every voice matters. Everyone should feel safe to share their thoughts and opinions, but everyone should also do so in a respectful manner while also being respectful of others who might disagree with them. All individuals are to be respected and treated with dignity and civility. ***Remember, you do not have to agree with someone's lifestyle, spirituality, or choices, but you can still respect them and interact with kindness.*** It is incumbent upon all of us to create an environment that fosters diverse voices. If at any point, you do not feel included, or if you read something in the discussions or elsewhere in the course that you feel violates this policy, please speak to me about it. Furthermore, violation of this policy could result in disciplinary action in the course or with the dean.

COVID-19:

For the most up-to-date information about how HACC is addressing the coronavirus, please visit: hacc.edu/COVIDannouncements

Students in Need of Accommodations:

The Student Access Services Department provides reasonable accommodations, auxiliary aids and support services to students with temporary or permanent disabilities (including pregnant and parenting students) as mandated by Americans with Disabilities Act, 1990 and Section 504, Rehabilitation Act, 1973 and Title IX of the Education Amendment of 1972. Students in need of accommodations or who would like to know more can contact Student Access Services at this link: <http://www.hacc.edu/Students/DisabilityServices/Contact-Disability-Services.cfm>

EEOC POLICY 005:

It is the policy of Harrisburg Area Community College, in full accordance with the law, not to discriminate in employment, student admissions, student access and/or student services on the basis of race, color, religion, age, political affiliation or belief, gender, national origin, ancestry, disability, place of birth, General Education Development Certification (GED), marital status, sexual orientation, gender identity or expression, veteran status, genetic history/information, or any legally protected classification. HACC recognizes its responsibility to promote the principles of equal opportunity for employment, student admissions, and student services taking active steps to recruit minorities and women.

The Pennsylvania Human Relations Act (“PHRAct”) prohibits discrimination against prospective and current students because of race, color, sex, religious creed, ancestry, national origin, handicap or disability, record of a handicap or disability, perceived handicap or disability, relationship or association with an individual with a handicap or disability, use of a guide or support animal, and/or handling or training of support or guide animals.

The Pennsylvania Fair Educational Opportunities Act (“PFEAct”) prohibits discrimination against prospective and current students because of race, religion, color, ancestry, national origin, sex, handicap or disability, record of a handicap or disability, perceived handicap or disability, and a relationship or association with an individual with a handicap or disability.

Information about these laws may be obtained by visiting the Pennsylvania Human Relations Commission website at <http://www.phrc.pa.gov/Pages/default.aspx#.V2HOujFuNS0>.

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