11:573:437 | Spatial Data Visualization and Map Design
Rutgers, the State University of New Jersey
School of Environmental and Biological Sciences
Fall 2020 -- 3 Credits

Instructor: Dave Smith  |  Email: dave.c.smith@rutgers.edu  |  Office Hours: By appointment

Prerequisites: Fundamentals of Environmental Geomatics Lab (11:573:233) or equivalent.
Course Website: CANVAS -- "MAP DESIGN (FALL 2020)"  https://rutgers.instructure.com/courses/71609
Video Conferencing: Zoom
Meeting Time: Friday, 3:55 – 6:55 p.m.

Learning Objectives:
1. Understand and apply the basic principles of the visual representation of spatial data such as symbol use, classification, and generalization.
2. Develop and apply technical skills required for computerized mapmaking using ArcGIS and Affinity Designer.
3. Develop and apply skills for clear visual communication of spatial information through mapping, such as appropriate color selection, development of strong visual hierarchy, and designing map products within specified formatting constraints.
4. Develop and apply a strong aesthetic foundation for map design through practice, analysis, and critique.

Course Description:
This course introduces students to the fundamental concepts of cartography: the design and construction of maps. By the end of this course, student[s] should be able to design effective and aesthetically sophisticated maps. They should also have the ability to interpret and critically evaluate the many maps that they encounter as they continue their academic and professional careers.

COVID-19 and Online Course Structure:
Due to the ongoing COVID-19 pandemic, this course will be held online. Because of the essential role of interaction and critique in the cartographic design process, class meetings will be held in real time. These meetings will typically be abbreviated, allowing students to work through tutorials and assignments on their own time.

One-on-One Meetings:
In addition, each week, students will schedule a 15-minute one-on-one online meeting with the course instructor to discuss and receive feedback on their most recent assignment.

Access to Computing Resources:
Each student will have access to a fully equipped lab computer via remote desktop. This will allow students to access and use any required software, regardless of the configuration their individual home computers as long as they have a stable Internet connection.

Required Course Materials:
- At least one paper map printed in its original intended format (i.e. not a reproduction in a book or a rescaled poster).
Projects and Assignments:

Mapping Exercises: each week, students will be presented with an exercise that addresses a different topic in map design or data visualization. These exercises will be completed outside of class.

Critiques: Each week, one or two students will volunteer to have their most recent map critiqued by the class. All students will be expected to volunteer to have at least one map critiqued, and all students will be expected to participate in critiques of their classmates’ work.

Map Design Analysis: Every two weeks, each student will be tasked with finding a map that they find to be particularly well designed and to write a short critique analyzing the cartographic decisions that contribute to the map’s effectiveness.

Final Project: Each student will design a fully developed large-format map or map series that communicates some phenomenon or phenomena of interest to the student.

Late Submission Policy:
Students are responsible for submitting all work on time. The material presented in this course is cumulative, and feedback is essential to improving. Any work submitted late will receive a 10% grade deduction. In addition, no specific feedback will be provided for work submitted more than one week late.

Grading:

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<th>Composition of Final Grade:</th>
<th>Numerical Ranges for Letter Grades:</th>
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<tr>
<td>Mapping Exercises</td>
<td>A: 90-100%</td>
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Attendance Policy:
More than two unexcused absences will result in a 10% reduction in your final grade. Each additional unexcused absence will result in a further 10% reduction in your final grade.

Absences may be excused in cases of illness, family emergency, or organized professional development events (e.g. conferences). In such cases, inform your instructor in writing within seven days of returning to campus.

Academic Integrity Policy:
Students will be held to the University's Policy on Academic Integrity, which can be found at: http://academicintegrity.rutgers.edu/

Plagiarism in any form is not accepted in this course. Cartography is a field where we often learn best from the work of others. There is a good chance that someone has already found a solution to a problem you are struggling with, or that you will find a map that inspires you think differently about how to approach a map that you are designing. While it is acceptable—and even encouraged—to incorporate some of those ideas into your own work, the majority of what you present in any map should be your own work. Imitating the overall style or layout of another cartographer’s work is not acceptable. While this is something of a gray area in terms of plagiarism, it should still be avoided at all costs.
Course Schedule:

Week 2 (September 11): Introduction
Assignment: Affinity Designer Video Tutorials (Due September 11)

Week 3 (September 18): Illustrator and Map Layout
Assignments: Preliminary Layout Mock-ups (Due September 17)
              Map Design Analysis 1 (Due September 25)
Readings: Brewer, Chapter 1 “Planning Maps”
          Brewer, Chapter 3 “Explaining Maps”
Optional Reading:

Week 4 (September 25): Typography
Assignment: Glen Helen Map Layout with Descriptive Text (Due September 24)
Reading: Brewer, Chapter 5 “Type Basics”
Optional Reading:

Week 5 (October 2): Labeling
Assignments: Glen Helen Map Layout with Descriptive text and Labels (Due October 1)
              Map Design Analysis 2 (Due October 9)
Reading: Brewer, Chapter 6 “Labeling Maps”
Optional Reading:

Week 6 (October 9): Projections, Coordinates, and Scale
Assignment: Mapping Hurricane Tracks at Multiple Scales (Due October 8)
Readings: Kimmerling, Chapter 2 “Map Scale”
          Kimmerling, Chapter 3 “Map Projections”
Optional Reading:

Week 7 (October 16): Thematic Mapping of Categorical Data
Assignments: Categorical Data - Hurricane Preparedness (Due October 22)
              Map Design Analysis 3 (Due October 22)
Reading: Brewer, Chapter 9 “Customizing Symbols”
Optional Reading: Rost: “How to pick more beautiful colors for your data visualizations”
Optional Video: Huffman, “Mapping in Full Monochrome”

Week 8 (October 23): Mapping Statistical Data I: The Choropleth Map
Assignments: Mapping Demographic Data in New Jersey I (Due October 29)
              Map Design Analysis 4 (Due November 6)
Readings: Foster “Statistical Mapping (Enumeration, Normalization, Classification)”
          Brewer, Chapter 8 “Color on Maps”

Week 9 (October 30): Mapping Statistical Data II: Other Methods
Assignment: Mapping Demographic Data in New Jersey II (Due November 5)
Reading: TBA
Optional Reading: Quinnan, et al. "Examining Implicit Discretization in Spectral Schemes"
Week 10 (November 6): Mapping Terrain Data
--FINAL PROJECT PROPOSALS DUE--
Assignments: Glacier National Park Terrain Representation (Due November 12)
              Map Design Analysis 5 (Due November 20)
Reading: Imhoff, Chapter 5 “The Problem and Its Characteristics”
Optional Reading: Bell, “Drawing Hillshade: A tutorial (with time lapse videos)”

Week 11 (November 13): Reference Maps
Assignment: Glacier National Park Trail Map (Due November 19)
Reading: Brewer, Chapter 2 “Basemap Basics” and TBA
Optional Reading:

Week 12 (November 20): Map Series
Assignment: Final Project Draft (Due December 3)
Reading: TBA
Optional Reading:

Week 13 (November 27): NO CLASS

Week 14 (December 4): Project Work and Pin-Up
--FINAL PROJECT DRAFT DUE--
Optional Reading: Nelson, “20 Unrequested Map Tips”

Finals Week (TBD): Final Project Critique
Optional Reading: Edney, Chapter 2 “Seeing, and Seeing Past, the Ideal”