



# DAT-241: Geospatial Data Analysis

Syllabus | Spring 2021 | Sec: NC71

Online, Synchronous

instructor:	<b>Eric C. Darsow</b> CCAC North CIT & Data Analytics Faculty, Instructor
office Hours:	<b>Mon-Wed: 5-5:45pm</b> <a href="https://ccac.zoom.us/j/6149618122">https://ccac.zoom.us/j/6149618122</a>
semester:	<b>Spring 2021</b> <b>Online, Synchronous</b>
instructor Contact methods:	<b>In-person preferred, followed by phone calls: 412.894.3020</b> Please do not email unless doing so is a special electronic mail use case as described on course website <a href="mailto:edarsow@ccac.edu">edarsow@ccac.edu</a>
CCAC CIT department	<b>Angie Ondrik (CIT &amp; SEM)</b> <a href="mailto:aondrik@ccac.edu">aondrik@ccac.edu</a> (412)469-6484.
CIT Dept chair	<b>Professor Rebecca E. Dupont</b> <a href="mailto:relinich@ccac.edu">relinich@ccac.edu</a>
CIT Dean	<b>Dean Brenda Trettel</b> <a href="mailto:btrettel@ccac.edu">btrettel@ccac.edu</a>
course Credits	<b>3.0</b>
prerequisites	(DAT-201 or equivalent) Deprecated

## I: Course Description:

In this course students assemble, analyze, and present map-based data in this first course in geospatial analysis. Since many datasets now include spatial components, students will approach the exciting sub-field of spatial data analytics with a focus on improving organizational decision making by creating static and interactive maps. To build a foundation of spatial reasoning, students explore map projections and x-y-z coordinate systems through hands-on exercises. Students then engage software tools to digitally represent spatial data from a variety of domains including municipal administration, ecology, transportation, marketing, and epidemiology. Finally, the course prepares students to integrate spatial analysis into data pipelines by connecting mapping software packages with relational databases and web servers.

## II: Learning Outcomes

1. Demonstrate the principal components of map projections and coordinate reference systems to compare their strengths and weaknesses for various analytic applications.
2. Build digital maps which visualize layers of point, line, and polygon based data.
3. Design map symbology systems such as choropleth shading, proportional centroid sizing and feature labeling to appropriately emphasize feature layers to inform decision making.
4. Apply appropriate spatial analytic algorithms to data layers, visualize their output and interpret the results using domain-specific knowledge.

5. Present the results of spatial analysis using static layouts and interactive maps in language accessible to an audience of knowledgeable non-experts.

## III: The nitty gritty

textbook & materials	<i>Books appropriate to your subdomain of interest</i> <b>Course website:</b> Master course website with session-specific content, submission portals, and assignment details: <a href="https://technologyrediscovery.net#gis">https://technologyrediscovery.net#gis</a>
letter Grades	Drawing on completed work and contributions to our class learning environment, <b>propose a fair letter grade and a justification at midterm and final times using a 3x5 card.</b>  <a href="https://technologyrediscovery.net/courses/Gen/trgrading.html">https://technologyrediscovery.net/courses/Gen/trgrading.html</a>  <b>Participate in final project sharing:</b> Sharing your own and reviewing a final project from a peer is required to sufficiently justify a grade proposal of A or B
due date	Weekly work cycles start on Tuesday, and end on Sunday at morning light. Final work submission and grade proposals will be accepted until Monday, <b>17-MAY-2021 @ morning light</b> but no later.
attendance & tardiness	As an online course, there are no scheduled session times, but rather weekly assignments <b>please complete 75-85% of weekly work.</b>
tests:	<b>No high-stakes tests!</b> Low-stakes, mini assessments and projects will constitute the bulk of your submitted work.
technology	You should have a computer capable of running a python interpreter or an R interpreter.
Academic Honesty	<b>Provide written credit to all relevant authors</b> of all code, writing, and project work for this course, including yourself and folks who help you (but who may not be published authors). Include direct URLs of websites consulted.  <b>Honor the copyrights</b> associated with all content used in this course.  <b>Consequences:</b> Students suspected of academic dishonesty will be asked to produce documentation to support any attributions (or, non-attributions).

## V: Content licensing and sharing

licensing	<p>All non-computer code content on technologyrediscovery.net (course content, images, media) is licensed under the Creative Commons Share-Alike license (CC BY-SA 4.0); no attribution required.</p> <p><a href="https://creativecommons.org/licenses/by-sa/4.0/">https://creativecommons.org/licenses/by-sa/4.0/</a></p> <p>Computer code is licensed by file; most course code is copylefted under the GNU Public License</p>
contribute	<p>You are invited to anonymously contribute your work products in this course to the freely reusable <i>creative commons</i> educational material ecosystem made possible by copy left licenses. Any work contributed to this course will fall under this site-wide license scheme.</p>

## IV: Official CCAC notices

my. ccac. edu	<p>Students are reminded that they can access their course information and CCAC email account, the CCAC Academic Calendar (including add/drop/withdrawal deadlines), the Student Handbook, the College's Incident Report form, and many other College services through the MyCCAC portal: <a href="https://my.ccac.edu">https://my.ccac.edu</a></p>
student handbook	<p>All students are expected to read and comply with the policies and regulations set forth in the CCAC Student Handbook, including without limitation the College's policies regarding academic and behavioral conduct, the procedures for requesting an accommodation based upon a disability, pregnancy or pregnancy related condition, or a religious observance, and for reporting unlawful discrimination and harassment.</p> <p>The Student Handbook is available to view and download along with the full text of the College's <i>Policy Manual</i>, <i>Administrative Regulations Manual</i>, and the Civil Rights Complaint Procedure:</p> <p><a href="https://www.ccac.edu/academic-rules-and-regulations/rules-and-regulations.php">https://www.ccac.edu/academic-rules-and-regulations/rules-and-regulations.php</a></p> <p><a href="https://www.ccac.edu/president/policies-and-regulations.php">https://www.ccac.edu/president/policies-and-regulations.php</a></p>
diversity	<p>Title IX of the Education Amendments 1972 (20 U.S.C. 1681 et seq.) and its implementing regulations, 34 C.F.R. Part 106, prohibit discrimination on the basis of sex in education programs or activities operated by recipients of Federal financial assistance. It is the landmark legislation that bans gender based discrimination in schools and colleges.</p> <p><i>"No person in the U.S. shall, on the basis of sex be excluded from participation in, or denied the benefits of, or be subjected to discrimination under any educational program or activity receiving federal aid."</i></p> <p><a href="https://www.ccac.edu/diversity/title-IX.php">https://www.ccac.edu/diversity/title-IX.php</a></p> <p><a href="https://www.ccac.edu/diversity/notices.php">https://www.ccac.edu/diversity/notices.php</a></p>
disability	<p>Information concerning the process and documentation required to request a disability-related accommodation can be obtained by contacting the campus' Office of Supportive Services for Students with Disabilities (OSSSD) or by visiting the OSSSD information page</p> <p><a href="https://www.ccac.edu/supportive-services/suppotive.php">https://www.ccac.edu/supportive-services/suppotive.php</a></p>