

The Geography of Innovation

Monday and Wednesday
5:00 pm-6:15 pm
Skiles 269

Instructor:

Professor Chris Esposito
cesposito8@gatech.edu
Office: 224B D.M. Smith
Office Hours: Wednesdays 3:30-4:30

Generic course description (from Course Catalog):

Examination of the growing discussion on the knowledge economy, learning regions, innovation capacity, and place management and what those strategies mean for regional economies.

Detailed course description:

If knowledge were weightless, innovative activities would be conducted all around the world. But innovative activity is concentrated is disproportionately carried out in a few corners of the globe – for example, Silicon Valley, Seattle, the Boston metropolitan area, Stockholm, London, Hangzhou, Bengaluru, and increasingly Midtown Atlanta. Their hold on that activity has tightened over the past half-century, even as communication technology advanced from expensive long-distance calls to free video conferencing with anyone on earth. If ideas can cross the globe at the speed of light, why does the creation of new ideas remain so stubbornly concentrated?

The answer to this question matters well beyond the academic literature. Domestically, it determines whether a struggling region can build a knowledge economy. It determines whether the billions of dollars that federal and state governments are now spending to engineer new innovation hubs will produce durable growth. Internationally, it shapes the contest for scientific and technological leadership: how the United States built its leadership position, how China is challenging it, and whether the policy instruments the U.S. is currently using to defend its position, from export controls to research security rules, can and will work.

In this course, we will learn how complex, uncoded, half-formed knowledge moves between people, how its exchange clusters innovative activities in places, and how the localization of knowledge attracts in-migrants, chokes housing markets, and induces spiraling inequality. We will explore why once-prosperous regions lost their edge, why policy initiatives to stimulate regional innovative development often fail, and why not all innovative regions are equally wealthy. We will conclude by extending the analytical framework developed in this course at the regional (or metropolitan) level to the international scale, where a similar logic applies to international competition for scientific and technological leadership between countries.

You will also learn to take apart claims made by academics, policymakers, and pundits about regional innovative growth. Claims about regional economies are made constantly and defended poorly. Over the semester you will work through the causal identification behind a major empirical study, dissect a real economic impact report claiming that Georgia Tech contributed \$6.3 billion to the state's economy in 2025, and evaluate a live federal policy that is steering millions of dollars in federal spending.

The course culminates in a project evaluating one of the NSF Regional Innovation Engines, a recent federal effort to seed innovation-based economies in regions across the United States. You will choose an Engine, diagnose the region it serves using course frameworks, your own research, and a dataset of scientific and technological output that I will provide, and reach a judgment about whether the bet was a sensible one and where the region can realistically grow.

This course does not require a background in economics. Students without backgrounds in economics or statistics will find that the course helps them to prepare for future coursework in those areas.

Course objectives and learning outcomes:

Upon completion of this course, I want you to be able to:

- Distinguish scientific and technological knowledge from other types of economic resources
- Explain how knowledge is generated and how its creation and control shape the economic fortunes of geographical regions
- Explain the challenges facing declining regions and the regions hoping to spur local innovation-based growth
- Analyze the distributional consequences of innovation-led growth, both within and between regions.
- Understand how value is captured from knowledge
- Extend the frameworks developed in this course to interpret recent developments in international competition for scientific and technological leadership
- Critically evaluate empirical evidence, including causal claims and economic multipliers

Required materials:

All required course readings and materials will be available via Canvas (<https://canvas.gatech.edu>) or from links in the course schedule. Lectures and course assignments build on the readings, so it is very important that you read the assigned materials carefully and think about them critically. They are the foundation for the concepts we cover in the course.

Course schedule:

The course schedule, which lists required readings and provides more thematic details on the course, can be accessed on Canvas.

In-Class Exercises:

We will complete three in-class exercises (workshops) that focus on methods and exploratory data analysis. You will complete a handout as you work on the workshop and hand in the handout to me at the end of the class meeting.

Final Project:

Over the second half of the semester, you will complete a final project evaluating one of the NSF Regional Innovation Engines, a recent federal effort to build innovation-based economies in regions across the United States. You will select an Engine, assess the region it serves, and evaluate its prospects by drawing on course concepts, your own outside research, and a dataset I will provide on scientific and technological output across U.S. regions. The project is designed to bring together themes from throughout the course and to give you practice supporting an argument with evidence rather than assertion. You will submit a written report near the end of the semester and present your findings to the class, where you will also be expected to ask substantive questions of your classmates and respond to the questions that they ask.

Grading Policy:

You will be graded on each in-class workshop, attendance and participation, the midterm, a final project report, a final project presentation, and your thoughtful questions during your classmates' final presentations.

For all workshops that you turn in to me, I will provide your grade within one week. Participation will be assessed each week based on your engagement in in-class discussions. More important than simply contributing is to contribute to class discussions in a thoughtful manner, demonstrating that you completed the assigned readings, and helping to advance the class discussion in a productive way.

I expect you to turn in the workshop assignments at the end of their associated class session. Final projects are due at 11:59pm on Dec 1. All assignment (workshops and final projects) that are not submitted late without written documented excuse from the Office of Student Life will have 20% of their score deducted for each day they are late.

Expectations for B.S., M.S., and Ph.D. Students:

This course is cross-listed for B.S. and M.S. students and may have a handful of enrolled Ph.D. students. Generally, B.S. and M.S. students will be expected to complete the same coursework. M.S. and Ph.D. students will be given a slightly different midterm examination than the B.S. students, but their midterms will otherwise be evaluated by the same criteria. For the final projects, Ph.D. students will be given a more complex dataset to analyze as part of their projects.

Grading Scale:

Final grades will be assigned as a letter grade according to the following scale:

- A 90-100%
- B 80-89%
- C 70-79%
- D 60-69%
- F 0-59%

Assignments/Weight:

Component	Weight	Due / exam date
Attendance and participation	20%	
Workshop 1: Causal identification	5%	End of class, 9/9
Workshop 2: Did Georgia Tech really contribute \$6.3 billion to Georgia?	5%	End of class, 10/14
Workshop 3: Tracing knowledge trajectories	5%	End of class, 11/11
Midterm	15%	In-class, Sept 30
Final project report	30%	End of day (11:59pm), Dec 1
Final project presentation	15%	In-class, Dec 2 / Dec 7
Final project questions on classmates' presentations	5%	In-class, Dec 2 / Dec 7

Attendance Policy:

You are expected to attend all classes. According to Georgia Tech policy, excused absences (e.g., illness, family crises) require written documentation, which can be obtained through the Office of Student Life (see link below). Communication is a critical factor that we use to determine whether an absence is excused. If you have advance knowledge of an absence, please let me know before the event. Absences that occur without prior notification or where proper documentation is not provided will be considered unexcused. For each unexcused absence, 2 points will be deducted from the 20 points comprising your attendance/participation grade. Please consult this link to understand our mutual expectations, rights, and responsibilities, including in instance of a medical or personal emergency. <http://www.catalog.gatech.edu/policies/student-absence-regulations/>

Computer and Phone Policy:

Computers and phones are wonderful devices, but they can also be a major distraction. There are some in-class activities that will require a computer (I have noted these dates in the course schedule). For all other class meetings, I ask you to keep your laptops and phones away. Please let me know or contact the Office of Disability Services if this presents a specific issue for you.

Plagiarism, Academic Integrity, and Large Language Models:

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. All students enrolled at Georgia Tech, and all its campuses, are to perform their academic work according to standards set by faculty members, departments, schools, and colleges of the university; and cheating and plagiarism constitute fraudulent misrepresentation for which no credit can be given and for which appropriate sanctions are warranted and will be applied. For information on Georgia Tech's Academic Honor Code, please visit <http://www.catalog.gatech.edu/policies/honor-code/> or <http://www.catalog.gatech.edu/rules/18/>.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Usage of large language models is permitted to generate outlines, brainstorm ideas, or organize your thinking. But anything you submit for your class must be written in your own words. I want learning outcomes to be met, so if I have reason to believe you have copied and pasted without understanding the logic of a statement or characterization of an issue, you will be penalized for it. As a best practice, you can avoid any risk of being falsely accused by using document preparation software that allows version control and tracking.

Please also consider the following before copying and pasting text from an LLM:

1. A copy of the original LLM text exists server-side. Companies may eventually offer database comparison as a service, or data can be leaked.
2. Detection methods are currently noisy, but may become more reliable over time.

If you are caught cheating, you can be retroactively punished for it, and the institute can rescind degrees obtained dishonestly. You are not only betting on not getting caught now, but you are betting on never getting caught in the future.

Accommodations for students with disabilities:

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404) 894-2563 or <http://disabilityservices.gatech.edu/> as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-faculty expectations:

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgment, and responsibility between faculty members and students. See the GT catalog (<http://www.catalog.gatech.edu/rules/21/>) for an articulation of some basic expectations that you can have of me and that I have of you. In the end, respect for knowledge, hard work, and cordial interactions will help build the environment we seek. I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Academic and/or mental health concerns:

If, throughout the semester, you have concerns regarding your (or a classmate's) academic performance and/or mental health, the Dean of Students, CARE, and Counseling Centers are available to assist at any point in the semester. Please keep these resources in mind if you feel overwhelmed or are struggling with any matters (e.g., transition to GT, relationships, family, stress, depression, etc.). Here are two support systems available for students:

- CARE: CARE is the primary resource for mental health support at Georgia Tech. Students seeking assistance from the Counseling Center or Stamps Psychiatry need to visit CARE first for a primary assessment and referral to on- and off-campus mental health and well-being resources. <https://care.gatech.edu/>

- STAR: Students' Temporary Assistance and Resources (STAR) is an organization that provides stability for students to pursue a fulfilling college experience. It does this by facilitating collaboration between organizations offering student support and increasing campus awareness of these programs. The five points of the star are food, finances, clothing, housing, and connections. <https://studentlife.gatech.edu/content/star-services>