

**I ILLINOIS**

Geography & Geographic  
Information Science

SCHOOL OF EARTH, SOCIETY & ENVIRONMENT

# **Graduate Program Handbook**

**August 2020**

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# OVERVIEW

*“The power and beauty of geography allow us to see, understand, and appreciate the web of relationships between people, places and environments.”*

## Background

The University of Illinois at Urbana-Champaign is among the nation’s most distinguished teaching and research institutions. The campus is the home of the second largest academic library in the United States and the largest map collection among public universities.

A national leader in the field of computer design and applications, the Urbana-Champaign campus also houses the National Center for Supercomputing Applications (NCSA) and is home to Blue Waters, a sustained-petaflop supercomputer. The campus serves approximately 43,000 students of whom about 10,000 are engaged in graduate work in more than 100 fields of study. An internationally recognized graduate faculty of approximately 3,000 members works closely with graduate students in their respective fields.

The Department of Geography and Geographic Information Science (GGIS), formerly the Department of Geography, has a long and distinguished history of world-class scholarship. For more than 50 years, the department has been consistently ranked one of the nation’s top geography departments for its quality of research and instruction.

## Research Areas

The department is currently organized around three core areas of specialization:

### Cities, Space, and Society

This program recognizes the dramatic growth in the size, number, and population of cities across the globe in the last ten years as the influence of cities across regions and nations deepens. This track examines the ever-evolving form, function, problems, and possibilities in these places. Empirical focus extends to cities and their relations as they operate in North America, the global north, and the global south.

### Geographic Information Science

This area of specialization focuses on developing and utilizing geospatial data, methods and technologies for understanding a wide range of social and environmental issues. Areas of emphasis include: Cyber-GIS, spatiotemporal GIS, satellite remote sensing, spatial analysis, qualitative GIS, and GIS and society.

### River, Watershed, and Landscape Dynamics

Using state-of-the-art field and laboratory equipment, researchers tie together geomorphological, hydrological, and ecological processes and phenomena to advance understanding of rivers, watershed, and the landscapes affected by them.

## **Degree Programs**

The department of Geography & GIS offers three graduate programs:

- Master of Arts (MA)
- Master of Science (MS)
  - Master of Science (MS) with Professional Science Master's in GIS Concentration (PSM).
- Doctor of Philosophy (PhD)
  - For students entering with a bachelor's degree (Accelerated PhD)
  - For students entering with a master's degree

## **Financial Assistance**

The department offers a wide range of financial support for graduate students in our Master's and PhD degree programs (excluding the self-funded PSM in GIS) including teaching assistantships (TA), research assistantships (RA), and department and university fellowships, which are offered to admitted and continuing students based on the strength of their application, stated research or teaching interests, and continued positive performance.

## **Teaching Opportunities**

Graduate students who specify college or university teaching as one of their primary career objectives are strongly encouraged to gain teaching experience by serving as a Teaching Assistant and/or by serving as course instructor. Before becoming a teaching assistant, all graduate students must complete the Center for Innovation in Teaching & Learning Graduate Academy, offered 1-2 weeks before each semester begins.

The department will make every effort to provide a primary teaching opportunity for doctoral students at least once during their program. Recommendations for teaching positions will be guided in part by the student's teaching record. In addition, the Center for Innovation in Teaching and Learning offers extensive workshops and seminars in professional development, as well as a teaching certificate.

## **Geography Graduate Student Association (GGSA)**

All Geography & GIS graduate students are welcome to join and participate in this student-run organization responsible for planning several academic and social events, including a yearly invited colloquium speaker. Board elections are held each year.

# Graduate Student Policies

## UIUC Graduate College Policies and Procedures

This Geography & GIS handbook contains our department's specific degree programs, timelines, and expectations.

The Graduate College Handbook contains policies, procedures, and rules that apply to all graduate students at the University of Illinois. Please refer to the Graduate College Handbook for specific rules regarding exams, registration, tuition waivers, expected graduation dates, petitions, and much (much much) more: <https://grad.illinois.edu/handbooks-policies>

## Academic Integrity

Responsible academic integrity and professional conduct are important for maintaining the high quality of research and education at the University of Illinois. The Illinois official statement on integrity in research and publication can be found at: <https://humanresources.illinois.edu/employees/policies/Integrity-in-Res-and-Pub.html>

In addition, the School of Earth, Society, and Environment requires a Responsible Conduct of Research Training to be completed each year. Graduate students should also be aware of academic integrity and intellectual property policies: <https://grad.illinois.edu/gradhandbook/2/chapter9/academic-integrity>

## Computer Policy

The Department of Geography & GIS **does not** provide graduate students with personal computers; however, graduate students can use the computer and connect to the shared printer in Room 2048 NHB. Computer hardware and software requirements for graduate research and coursework vary greatly across the discipline and by faculty advisors. Some faculty members may provide their advisees with computing resources. Please speak with your faculty advisor(s) about computing needs for your research.

**SESE-GIS** is a Windows Remote Desktop Host maintained by the School of Earth, Society, and Environment (SESE) IT group. All Geography & GIS faculty and graduate students are automatically eligible for an account on this machine, which can host large data sets and provides computational power and remote access to Windows software (MATLAB, ArcGIS, etc.). Please contact [help@earth.illinois.edu](mailto:help@earth.illinois.edu) for more information.

Graduate students may keep personally-owned computers in their departmental office, but in general these personal computers will not be maintained or supported by our IT staff. These personal computers also are required to have up-to-date antivirus software and be compatible with existing university-wide computer networks. Computers with improperly licensed software are not permitted or supported. The department or university cannot be held responsible for any personal items.

## Annual Review of Student Progress

Graduate student progress and accomplishments are reviewed annually to provide constructive feedback for students and their faculty advisors. Annual reviews of students will involve a two-step procedure. First, students will schedule a meeting with their advisor(s), discuss academic progress, and complete an online

self-evaluation. The advisor will then respond by completing their portion of the online evaluation, available at <https://my.atlas.illinois.edu/evaluations/>

The student's advisor must inform the Director of Graduate Studies of any disagreement of opinion between the student and the advisor on the performance evaluation, proposed plan of action, or both. The Department Head or other faculty member will provide the second review if the student's advisor is the DGS. It is stressed that the primary purpose of this review is to provide positive feedback and discussion to assist the student in their progress towards graduation and other career goals. The review will also be used as the basis for appointment and funding decisions.

At the final faculty meeting of each academic year, Geography faculty will discuss their individual students' degree progress and share concerns about particular students, as needed.

## **Email Policy**

Following the Graduate College policy, the @illinois.edu email address should be used for all University related correspondence. Department staff and the Director of Graduate Studies will send e-mails to your @illinois.edu address only.

## **Deadlines**

Students are responsible for their own registration and for ensuring the accuracy of their schedules. Students can check their registration online and print their schedules as needed. Students who find errors in their schedules should immediately correct these errors. Corrections must be completed before the deadline for adding or dropping a course as posted on the Graduate College web site.

The Graduate College provides announcements concerning academic deadlines, fellowship opportunities, and workshops each week through GradLinks. These email announcements and departmental emails are sent to your Illinois email address.

## **Transfer of Credit**

Please visit the Graduate College website for Transfer of Credit requirements:  
<https://grad.illinois.edu/transferring-credit>

# Master's Program (Master of Arts / Master of Science)

The Department of Geography & Geographic Information Science awards the Master of Arts or Master of Science degree in Geography to those who successfully complete the Department's general MA/MS requirements and the requirements of one of the Department's areas of specialization-(Cities, Space, and Society; Geographic Information Science; River, Watershed, and Landscape Dynamics). In exceptional cases, a student may obtain a degree outside a normal program through separate agreement with an individual faculty member and approval of the Director of Graduate Studies.

The purpose of the Master's program is to provide a framework by which the candidate may obtain competence in at least one of the systematic branches of geography and support this with mastery of at least one primary research technique and a basic understanding of geographic information systems (GIS). Master's degree work incorporates formal class work, seminars, and research experience.

Admission to a Master's degree program is restricted to those applicants who have demonstrated high academic ability (a 'B' average is a generally accepted minimum requirement). A complete application requires: a completed online application; three letters of reference, official transcripts from each academic institution attended. Applicants are advised that the Admissions Committee carefully evaluates the student's statement of purpose. *NOTE: As of the Fall 2020 admission cycle, we no longer require or evaluate applicants' GRE scores.*

Students whose native language is not English are required to meet the [English Proficiency Requirements](#) set by the Graduate College for admission. The policy for international teaching assistants can also be found on the Graduate College website at [English Proficiency Requirement for International Teaching Assistants](#). Graduate College regulations preclude review of any application from a foreign student that does not include a TOEFL/IELTS score.

## Advising

Students enter the Master's program intending to work with a particular faculty member, and the faculty member serves as the student's advisor. The advisor, who must be a member of the Geography & Geographic Information Science graduate faculty, will aid the student in formulating a tentative degree program comprising the most appropriate courses according to the student's background, interests, and career objectives. The advisor and student should meet regularly to discuss progress and future plans. Effective communication between student and advisor are critical for Master's success. Either the student or the faculty advisor is free at any time to request a change in advising assignment.

At these meetings the student's career objectives and primary interests within the discipline and cognate fields will be reviewed, as well as any deficiencies and appropriate measures to overcome them. The advisor will assist the student in selecting courses for the first semester.

## Master's Program Requirements

The Graduate College requires that at least 32 hours of course work be completed for a Master's degree. Twelve of the 32 hours must be in 500 level courses, and at least eight of these twelve must be in Geography & Geographic Information Science. An overlapping requirement is that at least 16 400/500 level hours must be accumulated in Geography.

## Master's Course Requirements:

### 1. GEOG 471: Recent Trends in Geographic Thought

This course provides students with a review of the geographic methodologies and philosophies that have prevailed in recent decades, as well as those of the present. In addition, this course provides students with exposure to the research methodologies of a variety of departmental faculty members. It is strongly recommended that the student take this course in the first semester of study.

### 2. GEOG 491: Research Methods in Geography

This course is designed to provide students with appropriate guidance in preparing and completing a research proposal in their area of interest, preferably one that they will then complete as part of their degree program. It is strongly recommended that the student take this course in the second semester of study.

### 3. GIS Requirement

All Master's students are required to take at least one course on geographic information systems (GIS) and related geospatial techniques. Options include:

- GEOG 439 Health Applications of GIS
- GEOG 440 Business Applications of GIS
- GEOG 460 Air Photo Interpretation
- GEOG 473 Digital Cartography and Map Design
- GEOG 476 Applied GIS to Environmental Studies
- GEOG 477 Introduction to Remote Sensing
- GEOG 478 Techniques of Remote Sensing
- GEOG 479 Advanced Topics in GIS
- GEOG 480 Principles of GIS
- GEOG 489 Programming for GIS
- Full course listing: <http://catalog.illinois.edu/courses-of-instruction/geog/>

Other graduate-level GIS courses may be applied to this requirement with the permission of the student's faculty advisor and the Director of Graduate Studies.

In addition to these formal requirements, the department holds a strong expectation that graduate students will attend the department and graduate student colloquium series on a regular basis. Such attendance is an important part of the student's professional development, and it is essential for maintaining the department as a vibrant intellectual community.

Each student must also fulfill the requirements specific to his/her specialty area (see statements beginning on Page 26). It is important to note that some areas of specialization (e.g., River, Watershed, and Landscape Dynamics) require a student to take the thesis option in completing their degree.

## Independent Study

Once students are ready to begin independent research, they should discuss the specific research topic and number of credit hours with their faculty advisor and then complete a **GEOG 595: Independent Study** webform. After completing the webform, the student will forward the webform email confirmation to their advisor and register for their advisor's unique GEOG 595 CRN.

- GEOG 595 webform: <https://go.illinois.edu/geog-595>



GEOG 595 may be taken for a letter grade or CR/NC (Credit/No Credit) grade. The CR/NC grade requires the completion of the [Credit/No Credit Form](#) by the deadline set by the Graduate College.

- a. The department restricts students to a maximum of 8 S/U credits or CR/NC grades, including the thesis if this option is taken.
- b. Students are not permitted to use S/U or CR/NC grades to meet the Graduate College's minimum requirement of three 500-level classes.
- c. Please note the Graduate College Handbook registration policies before registering for these credits.

The department requires all graduate students to maintain a 3.0 (B) average or better. All courses that are required, either by the department or by the student's area of specialization, must be passed with an A or B grade. For elective courses, the student's GPA must be at least 3.0.

### **Master's Research Paper Requirement:**

Students are required to initiate and complete a research project and present the findings in a set of research papers or a thesis; completion is understood to mean production of an acceptable written thesis or papers. For students in the GIS and Cities, Space, and Society areas of specialization, this requirement may be fulfilled in one of the following ways:

**a. Research Paper Option:** Two (2) written research papers which address substantive research questions; these papers will be submitted formally to the examining committee prior to the oral examination. Such papers are typically derived from 500-level research seminars, independent study, planned summer field experience, or from an internship.

**b. Thesis Option:** Successful completion of a Master's thesis. A maximum of 8 semester hours of thesis research (GEOG 599) may be counted towards the Master's degree; the Master's thesis must be approved by a member of the Graduate Faculty.

The research papers or thesis must be presented in a style used by one of the major professional journals. Students in the River, Watershed, and Landscape Dynamics are required to submit a thesis. The student will be expected to answer questions about the research papers/thesis during the Master's examination.

### **Final Examination for Master's Degree**

The student must have completed or must be enrolled in all courses needed for the degree and must have completed all other requirements before taking the Master's final examination.

The student and their advisor will select two additional faculty members to serve on the student's Advisory Committee. A majority of the committee must be GIS faculty members.

The final examination for students taking the "Research Paper Option" (option a.) will consist of both oral and written segments, but it will be viewed as a single unit for purposes of evaluating the student's performance. The written portion will consist of approximately five questions assembled by the advisor: one on the student's research technique, one on geographic philosophy and methodology, and three on the student's area of specialization.

The methodology question will deal primarily with research approaches being used in the student's area of the discipline as illustrated by recent books and periodicals. Within two weeks after the written portion is completed, the oral portion will be given. The committee will examine the student to assess his/her ability in analytical thinking and general knowledge of the contemporary situation in the declared area of

specialization. Students should not assume that their committee members will be willing to conduct an exam during the summer sessions or without adequate time to evaluate the dissertation.

Students who complete a thesis (option b) are not required to undertake a final written examination. However, they are required to undertake an oral defense of their thesis. As a result of either final examination, the committee will award the student a grade of:

- a. Pass; no major deficiencies. If taking the thesis option, the student is then responsible for meeting the Graduate College thesis deposit requirement.
- b. Fail; remediable deficiencies. If there are remediable deficiencies the committee will identify them, specify the nature of the remedial work to be done, specify a deadline for its completion, and specify a set of criteria for its evaluation. Failure to meet these requirements will result in a “fail”; successful completion will result in a “pass.”
- c. Fail; major deficiencies. If deficiencies are serious enough that, in the committee’s judgment, the student does not meet acceptable standards for a Master’s degree from this department, a “fail” will result. In this case, the student may appeal through established procedures to the Department’s Faculty Advisory Committee. The appeal will then be rejected or allowed. If allowed, the student will be re-examined orally by a new committee whose recommendation will be final.

**NOTE:** Whatever the outcome of the student’s examination, the advisor is required to submit a written record of the examination result to the Graduate Contact, as well as copies of the examination questions and written answers if the research paper option was followed.

## **Elective Courses for Master’s Program**

Elective courses are selected with consent of the advisor. Note the following requirements and restrictions.

- You must complete at least 16 credit hours at the 400/500 level in geography. Usually this is met by GEOG 471, GEOG 491, a GIS course, and two 500 level GEOG courses.
- A maximum of 2 elective courses may be taken S/U or CR/NC (including a thesis).
- If you write a thesis, only 8 hours of GEOG 599 credit will apply towards the minimum 32 hours needed for the Master's degree. Additional GEOG 599 credit may be earned in the course of completing the thesis, but will not reduce the 400/500 level credit needed to complete the degree requirement below the minimum level of 24 hours. The Graduate College requires that the Master’s thesis be approved by a member of the Graduate Faculty.

**NOTE:** This is an integration of university and departmental requirements and, therefore, represents the minimum requirements. Students must meet the minimum requirements set by both the department and the Graduate College in order to obtain a degree.

The degree requirements for Master of Arts and Master of Science in Geography are available online at:

- <http://catalog.illinois.edu/graduate/las/geography-ma/>
- <http://catalog.illinois.edu/graduate/las/geography-ms/>

# Summary of Master's degree requirements

## Course requirements:

- GEOG 471: Recent Trends in Geographic Thought
- GEOG 491: Research in Geography
- One GIS class
- At least 12 credit hours at the 500 level, at least 8 of those hours in GEOG
- At least 32 total credit hours

## Thesis option

- Prepare and defend a Master's thesis
- Independent research in your area
- Thesis committee: 3 faculty members, majority from GGIS

## Exam option

- 2 research papers (may be seminar/class papers)
- Oral and written exams
- Exam committee: 3 faculty members, majority from GGIS

# Master's Degree (MA or MS) Sample Timeline

Year 1	
<b>Fall term</b>	Coursework, including <b>GEOG 471 – Recent Trends in Geographic Thought</b>
	Meet with advisor regularly
<b>Spring term</b>	Coursework, including <b>GEOG 491 -Research in Geography</b>
	Meet with faculty advisor to discuss Master's thesis or exam option
	Thesis option: identify topic and select thesis committee

Year 2	
<b>Fall</b>	Coursework including <b>GEOG 595: Independent Study</b>
	<u>Thesis option:</u> <ul style="list-style-type: none"> <li>• Conduct research and begin writing thesis</li> <li>• Discuss deadlines and defense date with advisor</li> </ul>
	<u>Exam option:</u> <ul style="list-style-type: none"> <li>• Identify two research papers for requirement</li> <li>• Identify areas/topics for Master's exam</li> <li>• Form exam committee</li> </ul>
<b>Spring</b>	Coursework, incl. <b>GEOG 595: Independent Study</b> Thesis option: Register for <b>GEOG 599: Thesis Research</b>
	Apply for graduation in Student Self-Service
	Register for Convocation and Commencement ceremonies as desired
	<u>Thesis option:</u> <ul style="list-style-type: none"> <li>• Schedule thesis defense</li> <li>• Defend thesis and make corrections as indicated by committee</li> <li>• Submit thesis to department for format reviewer and make corrections as indicated. Current reviewer: Prof Tom Bassett, <a href="mailto:bassett@illinois.edu">bassett@illinois.edu</a></li> </ul>
	<u>Exam option:</u> <ul style="list-style-type: none"> <li>• Discuss content of exam with advisor</li> <li>• Schedule and take final exam</li> </ul>

\*When planning courses, remember that you need:

- At least 32 credit hours
- One GIS class
- At least 12 hours at the 500 level, with at least 8 of those hours in Geography and Geographic Information Science (this can include GEOG 595 and GEOG 599)
- Satisfy any specific course requirements for your area of specialization.

# Doctoral (PhD) Program

The PhD is a highly individualized degree program that emphasizes advanced training and research. Students develop and demonstrate both depth and breadth in geographical inquiry. They gain an understanding of the major epistemological and methodological questions that have shaped the development of geography as a discipline and master a set of research methods appropriate to their area of specialization.

Students acquire a detailed understanding of a particular sub-field of geography, conduct and disseminate independent research, and broaden their backgrounds through study in one or more allied disciplines. The program is intended to lead students into innovative research as demonstrated in research seminars, independent investigations, and the completion of a dissertation. The student's academic performance must be marked by initiative, intellectual integrity, a sense of problem identification, and critical acumen.

Admission to the PhD program is limited to those who have achieved distinction in previous undergraduate and graduate work (a 3.2 GPA on a 4-point scale is a generally accepted criterion) and who have demonstrated the determination and initiative required for doctoral success. Strong letters of recommendation are essential.

Students can enter the PhD program in two ways:

- [After earning a Bachelor's degree](#)
- [After earning a Master's degree](#)

Geography Master's students who wish to continue in our PhD must prepare an application, which includes:

- Three letters of recommendation
- Transcripts from all graduate and undergraduate schools attended
- Statement of purpose
- A Graduate College [petition](#) to change your degree program.

## Advising

Students enter the PhD program intending to work with a particular faculty member, and that faculty member serves as the student's faculty advisor. Students should meet with their faculty advisor at the time of arrival. At these meetings the student's career objectives and primary interests within the discipline and cognate fields will be reviewed, as well as any deficiencies and appropriate measures to overcome them. The advisor will assist the student in selecting courses for the first semester.

The advisor may be any member of the graduate faculty in the Department of Geography and Geographic Information Science (GGIS). Please see the Graduate College specifications for co-chair and co-research directors. The advisor and student should meet regularly to discuss progress and future plans. Effective communications between student and advisor are critical for PhD success. Either the student or the faculty advisor is free at any time to request a change in advising assignment.

Late in the spring semester of the first year (third year for combined Master's + PhD students) the student and their advisor will select two additional faculty members to serve on the student's Departmental Exam Committee. The majority of the committee members must be faculty members of the Department of Geography and Geographic Information Science.

The student, advisor, and other committee members will meet at the end of this semester and near the end of every semester thereafter (until the student graduates), each time discussing the student's progress with him/her and reporting that progress to the Graduate Committee through the advisor. Changes to the Departmental Exam Committee may be made at any time with approval of both the student and advisor.

All graduate students are required to maintain a 3.0 (B) or better G.P.A. and earn an A or B grade in all required courses. Although students consult regularly with their faculty advisor about progress and requirements, the primary responsibility for meeting Graduate College and departmental requirements, and for insuring good progress toward degree completion, lies with the student.

## PhD Course Requirements

### 1. GEOG 471: Recent Trends in Geographic Thought

Doctoral students are strongly recommended to take this course during their first semester, unless already taken as a Master's student.

### 2. GEOG 491: Research Methods in Geography

This course examines geographic research design and methodology. It is designed to provide students with guidance in preparing and completing a research proposal in their area of interest, preferably one that they will then complete as part of their degree program. Students are strongly recommended to take this course in their second semester.

### 3. Methods Requirement

All PhD students must take at least two graduate-level courses on analytical research methods from the following options:

- GEOG 439 Health Applications of GIS
- GEOG 440 Business Applications of GIS
- GEOG 460 Air Photo Interpretation
- GEOG 467 Dynamic Simulation of Resource Modeling
- GEOG 473 Digital Cartography & Map Design
- GEOG 476 Applied GIS to Environmental Studies
- GEOG 477 Introduction to Remote Sensing
- GEOG 478 Techniques of Remote Sensing
- GEOG 479 Advanced Topics in GIS
- GEOG 480 Principles of GIS
- GEOG 489 Programming for GIS
- GEOG 570 Advanced Spatial Analysis
- GEOG 587 Qualitative Research Methods
- Full course listing: <http://catalog.illinois.edu/courses-of-instruction/geog/>

Other graduate-level methods courses offered in Geography & Geographic Information Science also count towards this requirement. Courses from other departments or taken in a Master's degree program may be applied to this requirement with the permission of the student's faculty advisor and the Director of Graduate Studies.

Building upon the methods requirement, doctoral students are required to demonstrate competence in a specific research technique. Techniques may include: a foreign language (to the level of passing the ETS reading examination); quantitative or qualitative methods; GIS; cartography or other alternatives from outside the department. The student's advisor is responsible for defining the appropriate level of competency required.

## Independent Study

Once students are ready to begin independent research, they should discuss the specific research topic and number of credit hours with their faculty advisor and then complete a **GEOG 595: Independent Study** webform. After completing the webform, the student will forward the webform email confirmation to their advisor and register for their advisor's unique GEOG 595 CRN.

- GEOG 595 webform: <https://go.illinois.edu/geog-595>

GEOG 595 may be taken for a letter grade, S/U (Satisfactory/Unsatisfactory) grade or CR/NC (Credit/No Credit) grade. The CR/NC grade requires the completion of the [Credit/No Credit Form](#) by the deadline set by the Graduate College.

The department permits students to take a maximum of 8 credit hours of Geography 595 courses for an S/U or CR/NC grade. Students are not permitted to take CR/NC or S/U grades within their declared program of specialization, or to use CR/NC or S/U grade courses to meet the minimum departmental requirement of two 500-level classes.

In addition to these formal requirements, the department requires that graduate students attend all department and graduate student colloquia. The department has a formal colloquium series with its talks regularly communicated to graduate students. Such attendance is an important part of the student's professional development, and it is essential in maintaining the department as a vibrant intellectual community.

Each student must also fulfill program requirements specific to his/her specialization area. Please refer to the research area statements beginning on Page 26.

# PhD for Students Entering with a Bachelor's Degree

This degree program emphasizes academic, research and professional development tailored for the PhD degree so that students can move quickly into doctoral studies. A Master's degree, earned after completing certain requirements, is less emphasized than the PhD. The program is designed to take approximately 5 years, although the actual time to degree will vary. Alternatively, students with a Bachelor's Degree may wish to consider applying to the Master's program with a view to applying to the PhD program in their second year.

## PhD Combined Requirements (General)

The Graduate College requires that at least 96 hours of graduate coursework be completed for the PhD. Graduate coursework is defined as courses at the 400-level or above.

The program of study for the PhD for students entering the program with a Bachelor's degree has two distinct phases:

- The first two years are primarily devoted to coursework and completion of a research paper of publishable quality, which is reviewed by the student's Advisory Committee. Based on the research paper and the student's performance in the program, the committee decides whether the student is eligible to continue in the PhD program beyond the second year. At this stage, a student may be awarded a Master's Degree without being given permission to continue in the Geography PhD program.
- The second phase of the program involves completion of PhD requirements including additional course requirements, the Departmental Exam (Qualifying Exam), University Preliminary Exam, Final Examination (Dissertation Defense), and dissertation deposit.

**Methods Requirement.** All PhD students entering the program with a Bachelor's degree must take at least two graduate-level courses on analytical research methods from the options listed below. At least one of these courses must be in geographic information systems (GIS) or related geospatial techniques.

The department permits students to take a maximum of 8 credit hours of Geography 595 courses for an S/U or CR/NC grade. Students are not permitted to take CR/NC or S/U grades within their declared program of specialization, or to use CR/NC or S/U grade courses to meet the minimum departmental requirement of two 500-level classes.

## Doctoral Candidacy and Examinations

1. **Research Paper:** During the second year, the student will prepare, under the direction of his/her advisor, a research paper of publishable quality. The paper will be prepared in the format of a journal article and presented to the student's Advisory Committee for review and approval. The Advisory Committee will review the student's research paper and decide whether the student is eligible to continue in the PhD program. A copy of the research paper and a form signed by committee members describing the outcome of the research paper review will be submitted to the Graduate Contact and placed in the student's file.

Students who successfully complete the research paper, and have completed at least 32 credit hours of graduate coursework, including course requirements 1-4 above, will be awarded a Master's degree in Geography.



- NOTE: International Students who enroll in the accelerated PhD program will be awarded a Master of Science degree by default, which will make them eligible for Occupational Practical Training (OPT) upon completion of the PhD.
2. **Departmental Exam:** After the successful completion of the research paper and permission to continue to the PhD program has been authorized by petition, the student, in consultation with their advisor, will form a Departmental Exam Committee.

**PhD Requirements continue on Page 21.**

# Summary and Timeline of Accelerated MA/MS + PhD degree requirements

## Course requirements

- GEOG 471
- GEOG 491
- 2 methods classes, including one GIS class – see website for details
- At least 12 hours at the 500 level, at least 8 of those hours in Geography
- At least 96 total credit hours

## Research Paper (4<sup>th</sup> semester)

- Research paper of publishable quality
- Present research paper to advisory committee
- Advisory committee consists of 3 faculty members, at least 2 from Geography
  - Advisory committee decides if student is eligible to continue for PhD

## Departmental Exam (6th semester)

- Oral and written components. [Qualifying Exam Request form](#)
- Covers basic concepts, research methods, area of specialization
- Exam committee – 3 faculty members, 2 from Geography

## University Preliminary Exam (7<sup>th</sup> semester)

- Prepare dissertation proposal
- Present proposal at departmental colloquium or graduate colloquium
- Prelim exam involves a defense of the proposal
- Committee: at least 4 faculty members, 3 from Graduate Faculty, 2 tenured and majority from GGIS

## Dissertation preparation and defense

- Original research and a substantial contribution to knowledge
- Well written and in an acceptable format

## Final Examination

- Students must be registered during the term they take the final exam
- Revise dissertation as indicated during final defense

## Dissertation Deposit

- Students are not required to register during the term they deposit (after completing final exam)
- Refer to Graduate College Thesis Format guidelines: <https://grad.illinois.edu/thesis/format>
- Upon approval of committee revisions, submit completed dissertation to Department Format Reviewer for final formatting check before depositing.

Official PhD requirements are also posted at: <http://catalog.illinois.edu/graduate/las/geography-phd/#text>

# Accelerated Master's + PhD Program Sample Timeline

Year 1 -Accelerated PhD program	
Fall term	Coursework, including <b>GEOG 471 – Recent Trends in Geographic Thought</b>
Spring term	Coursework (discuss with advisor)
	Meet with advisor to discuss: <ul style="list-style-type: none"> <li>• Research Paper</li> <li>• Departmental Exam</li> </ul>
	Form Departmental Advisory Committee: 3 faculty members, majority from GIS

Year 2	
Fall	Coursework
	Research Paper: Conduct research and begin writing
Spring	Coursework, incl. <b>GEOG 595 Independent Study</b>
	Research Paper: Complete and submit to Advisory Committee <ul style="list-style-type: none"> <li>• Upon approval, submit Graduate College petition to change program to PhD</li> </ul>
	Meet with advisor and committee to discuss plans, reading lists, and departmental exam

Year 3	
Fall	Coursework, incl. <b>GEOG 595 Independent Study</b>
	Discuss dissertation topics with advisor
Spring	Coursework: <b>GEOG 491 – Research in Geography</b>
	Develop dissertation proposal in GEOG 491 and independently
	Take <a href="#">Qualifying Exam</a> and form Dissertation Committee – 4 members, 3 tenured

Year 4	
Fall	Coursework, mainly <b>GEOG 595: Independent Study</b>
	Complete dissertation proposal
	Present at GIS Colloquium Series
	Take University Preliminary Exam
Spring	Register for <b>GEOG 599: Thesis Research</b> only
	Conduct dissertation research

Year 5 – Accelerated PhD program	
Fall	Register for <b>GEOG 599: Thesis Research</b> only
	Dissertation research and writing
	Meet regularly with advisor
	Apply for jobs

<b>Spring</b>	Register for <b>GEOG 599: Thesis Research</b> only
	Apply for graduation in Student Self-Service
	Complete dissertation writing
	Schedule Final Exam
	Revise dissertation as indicated by Final Exam committee
	Submit dissertation to department format reviewer and make corrections as indicated Current reviewer: Prof. Tom Bassett, <a href="mailto:bassett@illinois.edu">bassett@illinois.edu</a>
	Register for Convocation and Commencement ceremonies as desired
	Dissertation deposit

\*When planning courses, remember that you need:

- at least 96 semester hours
- Two methods classes
- Satisfy any specific course requirements for your area of specialization

Professional development is also important:

- Gain teaching experience if you want to go into teaching
- Attend and present your research at conferences and around campus
- Submit papers for publication
- Network with colleagues in your field

# PhD for Students Entering with A Master's Degree

This program is designed to take approximately 3-4 years, although the actual time to degree is likely to vary.

## PhD Degree Requirements

The Graduate College requires that at least 64 hours of graduate coursework beyond the Master's degree be completed for the PhD degree. Graduate coursework is defined as courses at the 400-level or above.

## Departmental Qualifying Exam

By the end of the third semester in residence (6<sup>th</sup> semester for combined Master's + PhD students), the student will take a written and oral *Departmental Qualifying Examination*. It will be both evaluative and diagnostic and focus on the specific area(s) of interest, and the student's area of specialization within the program (e.g., GIScience, physical geography, etc.). A student must complete the [GGIS Departmental Examination Request Form](#) two weeks prior to the planned exam date. The written examination will cover the following areas:

- a. Basic concepts and literature in the area of specialization
- b. Research methods currently used in the area of specialization.
- c. Areas of interest within the area of specialization.

The advisor is responsible for assembling the questions and administering the written examination. Each question will be evaluated by the committee member who provided it, and the results will be circulated to the entire committee. Two faculty members must be physically present at the oral exam. Upon successful completion, an oral examination will be held to further examine the student's abilities and progress. The possible outcomes are:

- a. Pass; no major deficiencies.
- b. Fail; remediable deficiencies. If there are remediable deficiencies, the committee will identify them, specify the nature of the remedial work to be done, specify a deadline for its completion, and specify a set of criteria for its evaluation. Failure to meet these requirements will result in a "fail"; successful completion will result in a "pass."
- c. Fail; major deficiencies. If deficiencies are serious enough that, in the committee's judgment, the probability of the student's success in the Department's PhD program is low, a "fail" will be recommended. In this case, the student may appeal through established procedures.

Upon completion of the written and oral examinations, the advisor must complete a GGIS Departmental Examination Results Form and place a copy of the written questions, written answers, and the committee's decision in the student's file. This requirement must be met for degree completion.

## University Preliminary Exam and Dissertation Proposal

Upon completion of a successful departmental exam, a student in consultation with their advisor will form a Preliminary Exam Committee consisting of at least four faculty members, 3 must be members of the Graduate Faculty, 2 tenured, and a majority must be GIS faculty. By the end of the fourth semester, the student will prepare a written dissertation proposal and distribute among committee members for comment.

Since exposure of one's ideas to the critical review of peers and faculty is an important learning experience, each PhD student is required to make a public presentation of his/her dissertation proposal at a graduate or departmental colloquium.

Two weeks in advance of the presentation, the title and abstract of the proposal will be submitted to the Graduate Contact and circulated to the GIS community. A complete written version of the proposal will be given to the committee, and a copy will be made available to the department for perusal at least one week before the presentation.

As soon as possible after the colloquium presentation, the student will take the oral *University Preliminary Examination*. The preliminary examination will be administered by a committee appointed by the Graduate College upon recommendation of the advisor and student with the concurrence of the Director of Graduate Studies or Department Head.

Students must be enrolled for the entire academic term in which the preliminary exam occurs. According to Graduate College regulations, the committee must include at least four voting members, including the chair, who must be a member of the Graduate Faculty, three members of the Graduate Faculty and two tenured Illinois faculty members. The majority of the committee must be from GIS.

The examination will focus primarily upon a defense of the dissertation proposal but may include questioning and discussion on the student's area of specialty. The student, committee chair, and at least one additional voting member of the committee must be physically present for all oral components of the entire examination (i.e., presence by video or teleconference is not acceptable). If the committee has more than one chair, all chairs must be physically present; in these cases, no additional voting member is required to be physically present. All voting members of the committee must be present in person or participate via teleconference or other electronic media during the examination, deliberation, and results determination of all oral components of the examination. The outcome, determined by majority vote, may be:

- admission to candidacy;
- admission to candidacy denied pending the removal of apparent deficiencies and re-examination; or
- failure with a request that the student withdraw from the program.

Students who fail may retake the exam one additional time. The committee chair is responsible for convening the committee, conducting the examination, and obtaining the Preliminary Exam Result Form from the GIS Graduate Contact, who will submit it to the Graduate College.

A student's failure to schedule the preliminary examination within five semesters of enrollment after entering the PhD program will subject his/her record to review by an evaluation committee. In this evaluation the committee may recommend actions to address deficiencies or withdrawal from the program.

## Final Examination and Final Examination Committee

After the dissertation is provisionally accepted by the committee, an oral defense, the Final Examination (Defense of the Dissertation), is mandatory. Students must be enrolled for the entire academic term in which the Final Examination occurs. Outcome of that defense may be:

- pass the candidate with no revisions required,
- pass the candidate pending revision of the dissertation, or
- fail the candidate.

If the student passes with one dissenting fail vote on the Final Examination Result form (FER), the dissenting member may, but is not required to sign the Thesis/Dissertation Approval. Students who fail may retake the exam one additional time.

The final examination committee is appointed by the Dean of the Graduate College, upon recommendation of the Head or DGS of GGIS. The student's thesis advisor (i.e. Director of Research) need not be the chair of the committee, but this individual must have an affiliate or adjunct appointment in GGIS and should maintain an active research program. The chair of the final examination committee *must* be a member of the Graduate Faculty and of GGIS.

The committee chair is responsible for convening the committee, conducting the examination, and submitting the Final Examination Result Form to the GGIS graduate contact and to the Academic Services unit of the Graduate College. The student, committee chair, and at least one additional voting member of the committee must be physically present for all oral components of the entire examination (i.e., presence by video or teleconference is not acceptable). If the committee has more than one chair, all chairs must be physically present; in these cases, no additional voting member is required to be physically present. All voting members of the committee must be present in person or participate via teleconference or other electronic media during the examination, deliberation and results determination of all oral components of the examination. In cases in which the student passed with one dissenting fail vote (excluding the Director of Research on the Final Examination Result (FER), the dissenting member may, but is not required to sign the Thesis/Dissertation Approval.

A copy of the completed dissertation must be submitted to the advisor not less than four weeks prior to the scheduled oral defense of the document. The complete dissertation must also be submitted to the Committee at least two weeks in advance of the defense. In no case will a dissertation be accepted less than four weeks prior to the terminal date for PhD final examinations set by the Graduate College for each semester and summer session. The oral exam should be scheduled with close attention to the Graduate College deadlines. Students should not assume that their committee members will be willing to conduct an exam during the summer sessions or without adequate time to evaluate the dissertation.

## Dissertation

The dissertation is based on original research and must be a substantial contribution to knowledge. The candidate is encouraged to review progress regularly with his/her committee (usually identical to the preliminary examination committee) and especially with his/her advisor. It is the candidate's responsibility to comply with all [Graduate College Thesis Format and Content Requirements](#). The faculty member responsible for checking the format may also be consulted for guidance. Candidates are encouraged to complete their dissertation in residence.

# Summary and Timeline of PhD Requirements (entering with a Master's degree)

## Summary of Requirements

### Course requirements

- GEOG 471: Recent Trends in Geographic Thought
- GEOG 491: Research in Geography
- 2 methods classes – quantitative or qualitative, see course schedule for available options
- At least 64 total credit hours

### Departmental Exam (3rd semester)

- Oral and written components
- Covers basic concepts, research methods, area of specialization
  - Exam committee: 3 faculty members, 2 from Geography & GIS

### University Preliminary Exam (4th semester)

- Prepare dissertation proposal
- Present proposal at a graduate or departmental colloquium
- Prelim exam involves a defense of the proposal
  - Committee – at least 4 faculty members, majority from GGIS, at least 2 tenured, chair must be Graduate Faculty

### Dissertation preparation and defense

- Original research and a substantial contribution to knowledge
- Well-written and in an acceptable format

### Final Examination

- Students must be registered during the term they take the final exam
- Revise dissertation as indicated after exam

### Dissertation deposit

- Students are not required to register during the term they deposit (after completing final exam)
- Refer to Graduate College Thesis Format guidelines: <https://grad.illinois.edu/thesis/format>
- Upon approval of committee revisions, submit completed dissertation to Department Format Reviewer for final formatting check before depositing.



# PhD Timeline for students entering with a Master's degree

(a very ambitious 3-year program)

Year 1 – PhD (entering with MA/MS)	
Fall term	Coursework, including <b>GEOG 471: Recent Trends in Geographic Thought</b>
	Meet regularly with faculty advisor
Spring term	Coursework, including <b>GEOG 491 -Research in Geography</b> <i>Or take GEOG 491 later* if you need more time to develop a dissertation topic</i>
	Develop dissertation proposal
	Meet with advisor to discuss departmental exam
Year 2	
Fall	Coursework including <b>GEOG 595: Independent Study</b>
	Form departmental Qualifying exam committee
	Refine dissertation proposal with advisor
	Form Dissertation committee
	Take departmental Qualifying Exam
Spring	Coursework, incl. <b>GEOG 595 Independent Study (and GEOG 491*)</b>
	Present dissertation proposal at GIS Colloquium
	Take University Preliminary Exam
Year 3	
Fall	Register for <b>GEOG 599: Thesis Research</b>
	Dissertation research and writing
	Begin applying for jobs and attending conferences
Spring	Register for <b>GEOG 599</b> only
	Apply for graduation in Student Self-Service
	Complete dissertation writing
	Schedule and take Final Exam
	Revise dissertation as indicated during final exam
	Submit dissertation to department format reviewer and make corrections as indicated. Current reviewer: Prof. Tom Bassett, <a href="mailto:bassett@illinois.edu">bassett@illinois.edu</a>
	Register for Convocation and Commencement ceremonies as desired
	Dissertation deposit: <a href="https://grad.illinois.edu/thesis/deposit-checklist">https://grad.illinois.edu/thesis/deposit-checklist</a>

When planning coursework, remember that you need:

- at least 64 credit hours, including two methods classes
- Satisfy any specific course requirements for your area of specialization

Professional development is also very important:

- Gain teaching experience if you want to go into teaching
- Attend and present your research at conferences and around campus
- Submit papers for publication
- Network with colleagues in your field

# Department of Geography & Geographic Information Science

## Areas of Research Specialization

### Cities, Space, and Society

<https://ggis.illinois.edu/research/areas/cities-space-and-society>

#### Statement

The Cities, Space, and Society program recognizes the dramatic growth in the size, number, and population of cities across the globe in the last ten years as the influence of cities across regions and nations deepens. This track examines the ever-evolving form, function, problems, and possibilities in these places. Empirical focus extends to cities and their relations as they operate in North America, the global north, and the global south. Scholarly work in this track rests on the belief that robust theory and incisive empiricism are equally important elements to deeply understanding the current nuances of cities, their processes, and their relations.

Research methods used in this track to advance understanding of cities and metropolitan regions embrace a diverse set of tools and techniques, centering around the synergistic strengths of qualitative, quantitative, and GIS applications. Qualitative techniques (including field observation, ethnographic analysis, open-ended interviewing, survey research, archival search, and discourse analysis), quantitative techniques (including descriptive and inferential statistics, spatial analysis, analytic modeling, social network analysis), and geographic information systems analysis are equally important approaches.

Faculty and students in this program also examine environmental and contextual effects on health, land use change, gender and environmental perceptions, politics of transportation infrastructure, and vulnerable urban populations.

#### Emphases

This specialization has five emphases, all of which are concerned with geographical change, conflict, and development in both historical and contemporary contexts:

##### Spatial access to health care

- Socio-spatial segregation and wellness
- Social justice and health care provision
- Neighborhoods and Health
- Environment and health

##### Urban Governance and Politics

- Regimes of power and city redevelopment
- Discourses of city growth and city redevelopment
- Urban economic development and politics
- City policing strategies and social justice
- New and emerging suburban socio-political trends
- Urban political ecology

##### Urban Physical and Social Transformation

- City spatial structure

- City gentrification
- Creative city making
- New patterns of segregation
- Race theory

#### Critical Studies of Urban Transportation and Mobilities

- New infrastructural provision
- Critical perspectives on infrastructure and economic development
- Mobilities of people and freight
- Accessibility for different social groups (by race, class, gender, ethnicity)

#### Globalization, Neoliberalism, and the City

- City-global economic relations
- Changing neoliberal political dynamics
- Politics of the local urban state
- Neoliberalism, ghettoization, and incarceration
- Cities and the global south

### **Master's Requirements**

Students must meet all GIS requirements for the Master's program, including GEOG 471: Recent Trends in Geographic Thought, GEOG 491: Research in Geography, and a GIS course. Students can pursue the Thesis option or the Exam Option for the MA Degree. The thesis option may be required for entry into subsequent PhD programs.

### **PhD Requirements**

Students must meet all GIS requirements for the PhD in Geography including GEOG 471 and GEOG 491. Equivalent courses taken at previous institutions can meet this requirement. The dissertation must be within the advising competence of the faculty in the program and is expected to be an original contribution to the field and to involve the examination of geographic processes using appropriate research methodology.

### **Advanced Courses Offered in the Department**

- GEOG 410: The Geography of Development and Underdevelopment
- GEOG 412: Geospatial Technology and Society
- GEOG 438: Geography of Health Care
- GEOG 439: Health Applications of GIS
- GEOG 440: Business Applications of GIS
- GEOG 446: Sustainable Planning Seminar
- GEOG 465: Transportation and Sustainability
- GEOG 482: Challenges of Sustainability
- GEOG 483: Urban Geography
- GEOG 520: Political Ecology
- GEOG 560: Spatial Epidemiology
- GEOG 570: Advanced Spatial Analysis
- GEOG 587: Qualitative Research Methods
- GEOG 594: Seminar in Social Geography: the Turbulent City
- GEOG 594: Seminar in Social Geography: the Poststructuralist City
- GEOG 595: Seminar: The Urban Environment
- GEOG 595: Seminar: Mobilities

## **Related Courses Offered in Other Departments**

- AAS 479: Race, Medicine and Society
- ANTH 557: Social Construction of Space
- ANTH 565: Race and Cultural Critique
- PS 415: Neighborhoods and Politics
- SOC 421: Racial and Ethnic Families
- SOC 472: Urban Communities and Public Policy
- SOC 521: Sociology of Race and Racism
- SOC 578: Ethnography Urban Communities
- UP 406 : Urban Ecology
- UP 407: State and Local Public Finance
- UP 420: Planning for Historic Preservation
- UP 423: Introduction to International Planning
- UP 533: Community in American Society
- UP 535: Local Policy & Immigration
- UP 546: Land Use Policy and Planning
- UP 547: Regional Planning and Policy
- UP 552: Regional Development Theory
- UP 587: Qualitative Research Methods
- UP 589: Research Design and Methods

# Geographic Information Science (GIS)

<https://ggis.illinois.edu/research/areas/geographic-information-science>

## Statement

Revolutionary changes are taking place in how we process, analyze, and model the enormous quantities of geographic information generated by satellites, mobile devices, sensor networks, and other geospatial technologies. The Geographic Information Science specialization examines the nature of digital geographic information, the geospatial tools and methods for analyzing and modeling such information, and the value of geographic information for understanding economic, environmental and social transformations at the local, regional, national and global scales.

We emphasize methodological training in GIScience as the foundation for using geographic information to understand these changes and for developing innovative new tools and technologies for analyzing and managing geospatial information in the decades to come. Students also gain a critical awareness of the roles of geographic information and GIScience in society and the strengths and limitations of GIScience tools and technologies.

## Emphases

The Department of Geography and Geographic Information Science (GGIS) at the University of Illinois offers a graduate program leading to both the Master's and PhD degrees in Geography with a specialization in Geographic Information Science (GIScience). Students can focus on: (1) GIScience methods and theory in areas such as: geographic information systems, dynamic modeling, remote sensing, interregional modeling and spatial analysis; or (2) the application of GIScience methods in areas such as health, urban, physical, or environmental geography. Specific areas of emphasis include:

### GIScience methods and development

- a. space-time integration in GIScience
- b. satellite remote sensing
- c. Cyber GIS
- d. parallel and distributed computing
- e. multi-scale and distributed GIS

### Spatial Analysis

- a. geospatial big data analytics
- b. collection and analysis of GPS data
- c. spatiotemporal modeling and analysis
- d. agent-based modeling
- e. geostatistical modeling and landscape analysis
- f. spatial accessibility modeling

### Environmental and socioeconomic applications

- a. vegetation and climate change
- b. dynamics of watersheds and fluvial systems
- c. land cover disturbance and change
- d. health and health care
- e. urban travel and mobility
- f. GIS and society

## GIS Facilities

The Department of Geography & Geographic Information Science has a state-of-the-art laboratory for teaching in GIScience. The teaching laboratory consists of 30 workstations equipped with a wide variety of software for GIS, image processing, air photo interpretation, and spatial/statistical analysis. Students also have access to an array of input/output devices, including a large-format, color plotter. Facilities for GIS research are distributed among the research laboratories listed below. Campus-wide computing resources include the [National Center for Supercomputing Applications](#), a world-class facility for supercomputing.

## CyberGIS Center for Advanced Digital and Spatial Studies

The *CyberGIS Center for Advanced Digital and Spatial Studies* is internationally renowned for research in GIScience. Its mission is to empower advanced digital and spatial studies through innovation of CyberGIS technologies and applications. Founded and directed by Prof. Shaowen Wang, and housed in GGIS, the center addresses diverse GIScience challenges including: computationally intensive spatial analysis and modelling, CyberGIS, cyberinfrastructure-based geospatial problem-solving environments, computing and data-intensive applications and sciences, and high-performance and collaborative GIS.

More information at: <https://cybergis.illinois.edu>

## Prerequisites

Applicants to the Geography program with a specialization in GIScience are expected to have completed: 1) a course in GIS or cartography, 2) an introductory statistics course.

## Master's Requirements

Students must meet all GGIS requirements for the Master's degree including GEOG 471 (Recent Trends in Geographic Thought), and GEOG 491 (Research in Geography). In addition, students must complete at least three courses from the GIScience core. With permission of the faculty advisor, students may substitute GIScience-related courses offered in other departments. GIScience students are strongly encouraged to pursue the Thesis option for the Master.

## PhD Requirements

For admission to the doctoral program, with a specialization in Geographic Information Science, a completed Master's degree with thesis is required. Students must meet all Departmental requirements for the PhD degree including GEOG 471 (Recent Trends in Geographic Thought), and GEOG 491 (Research in Geography), or their equivalents. The GIScience specialization also requires GEOG 479 (Advanced Topics in GIS), or GEOG 480 (Principles of GIS), or the equivalent, and additional graduate coursework in one or more specialized areas of GIScience, including at least one 500-level course. Students are encouraged to take GIScience-related courses in fields such as computer science, agricultural economics, econometrics, and atmospheric sciences.

## Core Courses

- GEOG 412: GIS and Society
- GEOG 439: Health Applications of GIS
- GEOG 440: Business Applications of GIS
- GEOG 460: Analysis and Interpretation of Aerial Photography
- GEOG 467: Dynamic Simulation of Natural Resource Problems
- GEOG 468: Biological Modeling

- GEOG 473: Digital Cartography and Map Design
- GEOG 476: Applied GIS to Environmental Studies
- GEOG 477: Introduction to Remote Sensing
- GEOG 478: Techniques of Remote Sensing
- GEOG 479: Advanced Topics in GIS
- GEOG 480: Principles of Geographic Information Systems
- GEOG 481: Modeling Earth and Environmental Systems
- GEOG 489: Programming for GIS
- GEOG 570: Advanced Spatial Analysis

# River, Watershed, and Landscape Dynamics

<https://ggis.illinois.edu/research/areas/river-watershed-and-landscape-dynamics>

Students wishing to enter this area of specialization are strongly urged to contact the participating faculty member most closely matching their prospective research interests. The program emphases are closely tied to current research interests of individual faculty members. Please visit the website link above for a current listing of participating faculty.

## Statement

The **River, Watershed, and Landscape Dynamics** area of specialization builds upon the foundations of physical geography as an integrating science that examines the origins, contemporary development, and processes of the Earth's natural and human-modified surfaces. All participating faculty place strong emphasis on the theoretical underpinning of their research and teaching.

The principal research themes of this area of specialization reflect the specialties of the participating faculty. Each of the participating faculty has strong links to other departments and/or programs on campus and a high proportion of the research conducted in the specialization has a strong interdisciplinary flavor.

This specialization also maintains strong cross-campus connections with other water-related research programs in [Geology](#), [Civil and Environmental Engineering](#) and [Natural Resources and Environmental Sciences](#). Faculty in the program also maintain close working relationships with scientists in the [Illinois State Geological Survey](#), [Illinois State Water Survey](#), [Illinois Natural History Survey](#) and the [Illinois Water Science Center](#) of the U.S. Geological Survey, all of which are located on campus.

## Faculty Collaborators on Campus (teach related courses and serve on graduate student committees)

Alison Anders, Geology  
Marcelo Garcia, Civil and Environmental Engineering  
Praveen Kumar, Civil and Environmental Engineering  
Ximing Cai, Civil and Environmental Engineering  
Mark David, Natural Resources and Environmental Sciences

## Prerequisites

Students must already have completed, or take immediately upon entry into the program: 1) an introductory college calculus course a one course minimum is required, but course work through calculus of several variables is recommended), 2) college physics.

## MA/MS Requirements

The Geography Master's program, with a specialization in the **River, Watershed and Landscape Dynamics** follows the guidelines of the Graduate School and the Department of Geography and Geographic Information Science. Prospective students should appreciate that an important additional requirement is that the program requires master's candidates to undertake the thesis option.

Participating faculty consider the research experience to be an essential ingredient of graduate training in physical geography. Students should also appreciate that the participating faculty will usually supervise graduate research in areas that fall within their expertise.



## **PhD Requirements**

The Geography doctoral program, with a specialization in **River, Watershed and Landscape Dynamics**, follows the guidelines of the Graduate School and the Department of Geography and Geographic Information Science. Although students in the doctoral program focus upon a specialized topic they are expected to develop a general familiarity with all aspects of contemporary thought related to river, watershed, and landscape dynamics. Complementary course work outside the department in the form of a minor (see departmental requirements) is required.

## **Graduate Courses in the Department**

- GEOG 401: Watershed Hydrology
- GEOG 406: Fluvial Geomorphology
- GEOG 408: Watershed Analysis
- GEOG 460: Analysis & Interpretation of Aerial Photography
- GEOG 467: Dynamic Simulation of Natural Resource Problems
- GEOG 468: Biological Modeling
- GEOG 575: Alluvial Boundary Layer Dynamics

## **Related Graduate Courses in Other Departments**

- CEE 432: Stream Ecology
- CEE 450: Surface Hydrology
- CEE 453: Urban Hydrology and Hydraulics
- CEE 551: Open Channel Hydraulics
- CEE 559: Sediment Transport
- NRES 403: Watersheds and Water Quality
- NRES 490: Surface Water System Chemistry
- GEOL 440: Sedimentology and Stratigraphy
- UP 405: Watershed Ecology and Planning

## **Appendix**

**Director of Graduate Studies**

**Geography & GIS Mentoring Guidelines**

# Director of Graduate Studies (DGS)

The Director of Graduate Studies is a Geography & GIS faculty member designated by the department head who works with the Graduate Program contact to coordinate and regulate the department's Master's and Doctoral programs. DGS responsibilities include:

- Coordinate recruitment and application reviews of prospective graduate students, including fielding applicant inquiries (in cooperation with Graduate Program Contact).
- Consult with the chairs of the department's three research areas to determine total number of students to admit each academic year.
- Pursue external-to-department funding opportunities for prospective graduate students,
- Oversee the assignment of teaching assistants (TA) to introductory-level Geography courses.
- Oversee the distribution of departmental fellowships to new and continuing graduate students.
- Lead Fall Orientation for new graduate students.
- Provide current graduate students with information about degree requirements or their program of study.
- Organize department/alumni reception at the American Association of Geographers (AAG) Annual Meeting.

# Department of Geography & GIS Graduate Student Mentoring Guidelines

FACULTY	GRADUATE STUDENTS	GRADUATE PROGRAMS
<p>POSITIVE &amp; SUPPORTIVE ENVIRONMENT</p>	<p>POSITIVE &amp; SUPPORTIVE ENVIRONMENT</p>	<p>POSITIVE &amp; SUPPORTIVE ENVIRONMENT</p>
<ul style="list-style-type: none"> <li>• Foster the overall wellbeing of students</li> <li>• Provide students a safe, supportive environment</li> <li>• Interact ethically and professionally with other members of the university community</li> <li>• Be responsive and receptive to students' requests for academic feedback and professional advice</li> </ul>	<ul style="list-style-type: none"> <li>• Interact ethically and professionally with other members of the university community</li> <li>• Seek guidance when feedback is needed</li> <li>• Communicate about needs and concerns regarding academic and professional progress</li> </ul>	<ul style="list-style-type: none"> <li>• Foster the wellbeing of students</li> <li>• Provide students a safe, supportive environment</li> <li>• Interact ethically and professionally with other members of the university community</li> <li>• Connect students with appropriate university offices and resources</li> <li>• Help resolve student problems and conflicts</li> </ul>
<p>ACADEMIC SUCCESS</p>	<p>ACADEMIC SUCCESS</p>	<p>ACADEMIC SUCCESS</p>
<ul style="list-style-type: none"> <li>• Guide students in developing academic and research skills</li> <li>• Convey clear expectations for academic and research progress</li> <li>• Provide timely, constructive feedback and periodic evaluations</li> <li>• Evaluate students' performance fairly and objectively</li> <li>• Promote students' timely academic and research progress</li> <li>• Advise students on requirements for academic integrity, responsible conduct of research and other relevant policies</li> </ul>	<ul style="list-style-type: none"> <li>• Be receptive to academic and research direction and feedback from advisers</li> <li>• Take responsibility for knowing and fulfilling degree requirements</li> <li>• Take responsibility for knowing and executing ethical, professional norms</li> <li>• Understand and follow department, Graduate College and university policies, including academic integrity, student conduct and responsible conduct of research</li> </ul>	<ul style="list-style-type: none"> <li>• Provide information about degree requirements, academic policies and expectations</li> <li>• Share information about fellowships, awards and other academic opportunities</li> <li>• Monitor student academic progress, providing at least yearly evaluations and communicating these with students</li> </ul>
<p>CAREER DEVELOPMENT</p>	<p>CAREER DEVELOPMENT</p>	<p>CAREER DEVELOPMENT</p>
<ul style="list-style-type: none"> <li>• Foster the professional development of students to prepare for a wide range of future employment options</li> <li>• Assist students in achieving their career goals</li> <li>• Encourage engagement in professional communities and meetings to foster potential career opportunities</li> <li>• Advise students regarding the ethics of their profession</li> </ul>	<ul style="list-style-type: none"> <li>• Identify professional development needs and pursue appropriate opportunities</li> <li>• Take initiative for career exploration and the job search</li> </ul>	<ul style="list-style-type: none"> <li>• Promote student engagement in professional development programs</li> <li>• Foster the professional development of students to prepare for a wide range of future employment options</li> <li>• Direct students to resources that can help them pursue and succeed in their careers of choice</li> </ul>