

GEEMaP

Geoinformatics for Environmental and Energy Modeling and Prediction

2011-2012

Student Handbook

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Introduction

This document is a guide for students participating, or wishing to participate, in GEEMaP, an NSF-IGERT funded program designed to produce scientists with the quantitative, computational, and communication skills needed to conduct interdisciplinary research in the fields of environmental science and energy production and contribute to public- and private-sector decision-making on related issues. GEEMaP stands for “Geoinformatics for Environmental and Energy Modeling and Prediction.” The program melds faculty teaching and research expertise in traditional fields of Biostatistics, Geography, Computer Science, Civil and Environmental Engineering, Mechanical and Industrial Engineering, and Statistics to create a new cohort of students who are not only well grounded in domain science and engineering, but are also cross-trained in statistical and geocomputational methodologies. A hallmark of the GEEMaP project is its core focus on geoinformatics to capture and model human and natural processes as a means for promoting science, policy development and decision making in the areas of energy and environment.

Students can participate in the program at two levels, GEEMaP trainees and GEEMaP associates. GEEMaP trainees typically receive the first two years of their funding through this grant, with an additional three years of funding from teaching and research assistantships. Traineeships are limited and highly competitive. GEEMaP associates have the opportunity to participate in all of the educational opportunities afforded by GEEMaP but funding, if provided, will come from assistantships offered by individual departments. Students participating in GEEMaP will be enrolled in the Ph.D. program of one of the participating departments (Biostatistics, Geography, Computer Science, Civil and Environmental Engineering, Mechanical and Industrial Engineering, Occupational and Environmental Health, and Statistics) or the proposed interdisciplinary informatics Ph.D. program in Geoinformatics.

This Handbook should be considered a supplement to the *Manual of Rules and Regulations of the Graduate College*, the *General Catalog of the University of Iowa*, and any handbook prepared by the department within which GEEMaP trainees and associates are admitted.

The GEEMaP Philosophy

Academic training has traditionally been both discipline-centered and focused on basic science. Furthermore, the culture of academia tends to encourage graduate students to follow their mentors from graduate school to the academy, thus spending their entire career in the academic system. Recent trends suggest that an alternative model of graduate education is required, a model which recognizes that (1) the difficult problems facing society cross disciplinary boundaries, 2) society expects to see the products of science translate directly into real-world benefits, and 3) changes in society and in the workplace will result in increasing numbers of PhDs finding employment outside of academia. This alternative educational experience must combine the strengths of multiple disciplines within a truly integrated research and teaching environment. Moreover, it must serve to build important linkages between academic training and real-world applications, the very environment in which graduates will increasingly find themselves working.

The GEEMaP program is designed to provide such an experience and to build on three main programmatic pillars: (1) science, (2) technology, and (3) translational processes. Here we define science as *the production of knowledge and understanding*, technology as *the practical application of science*, and translation as *outcomes from science and technology that have immediate positive impacts in the real world*. We consider each of these pillars important to our goal of producing individuals who can thrive in and contribute to a rapidly changing world. Our philosophy of education can best be captured as:

science + technology + translation = knowledge and innovation that matters in the 21st century.

The overall education experience for our IGERT students is comprised of three tightly integrated elements (1) traditional coursework, (2) mentorship, and (3) practical experience. Practical experience includes: 1) collaborations with faculty and students in other fields where learning cuts across disciplinary boundaries; 2) direct interactions with grant program managers; 3) environmental field work where interactions with community members, state and local environmental officials, and research groups from other universities is common; and 4) internships in the private and public sector.

While the specific accomplishments of GEEMaP students will differ depending on the expectations within their individual departments, a GEEMaP student by the time of graduation typically will have submitted at least two first-author manuscripts and will have coauthored at least two additional submitted manuscripts. Many GEEMaP students will have developed computer software and made it available in the public domain. Since GEEMaP students from core geoinformatics disciplines (computer science, GIScience, (bio)statistics) and from applications disciplines (engineering, geography) collaborate in research groups, plans for papers and the order of authorships must be made early on in consultation with all members of the research group and all participating students' advisers. Typically, students from applications disciplines will be the first authors of papers targeted at journals in those fields, while students from the core disciplines will be the first authors of papers focused on methodological or technological approaches that they have developed. GEEMaP students may be coauthors on any manuscripts to which they have made substantive contributions.

Administrative Organization

The GEEMaP IGERT will be administered by a 5-member steering committee comprised of affiliated faculty and a student representative. The student representative will be elected by the IGERT trainees and associates. The steering committee will have overall responsibility for program coordination, research oversight, and communication with the NSF. Admissions and traineeship decisions will be made by the GEEMaP education and admissions committee, which consists of five program faculty members. This committee also advises first- and second-year students, and will coordinate the administration and evaluation of any student competitions that are formally part of the GEEMaP program.

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Admission

Admittance to GEEMaP is provisional on admittance to a Ph.D. program associated with a participating department or the proposed IGPI Geoinformatics program. Students seeking admission to the GEEMaP IGERT are also subject to the minimum standards set by the Graduate College, which include: (note thresholds below from IGPI)

- An undergraduate degree with a minimum GPA of 3.0 on a 4.0 scale;
- Submission of GRE scores;
- Three letters of recommendation;
- Non US students are required to take the Test of English as a Foreign Language (TOEFL) unless they have a degree from an accredited college or university in the U.S., the UK, Canada (except Quebec), Australia, or New Zealand. A minimum TOEFL score of 550 on the paper-based (PBT) or a minimum score of 81 on the Internet-based test (IBT) is required. Newly admitted graduate students who present TOEFL scores below 600 on the PBT or below 100 on the IBT are required to complete an English Proficiency Evaluation on campus before their first registration for classes.

All applicants and continuing students are required to have strong written and oral communication skills. The faculty takes several factors into consideration when evaluating an application for admission, including GRE scores, grades, letters of recommendation, intent and motivation for graduate study, and research interests. While there is no specific minimum for GRE scores, successful candidates will typically have very strong quantitative and analytical scores. Each candidate's application package, including the University of Iowa application form, official transcripts, test scores, and letters of recommendation, will be evaluated by the education and admissions committee. The Education and Admissions Committee will work closely with the sponsoring department during the review process.

GEEMaP trainees must be U.S. citizens or permanent residents. Candidates for GEEMaP traineeships will be interviewed by the Education and Admission Committee and potentially other GEEMaP affiliated faculty members (e.g., the faculty member who recruited the candidate).

Non U.S. citizens are welcome to participate as associates.

Students with deficiencies in one area may be admitted if all other parts of his or her application are very strong.

The Application Process

For prospective GEEMaP students who are not currently enrolled in a participating Ph.D. program, the first step is to apply for admission directly to the department in which they want to receive their Ph.D. Prospective students should be sure to observe all departmental application requirements (including deadlines) and inform that department that they also are applying to the GEEMaP program.

The seven departments and programs in which GEEMaP participants may enroll are:

[Biostatistics](#)

[Civil and Environmental Engineering](#)

[Computer Science](#)

[Geography](#)

Geoinformatics (proposed new degree program; not yet open for application)

[Industrial Engineering](#)

[Statistics](#)

All prospective GEEMaP students must also apply directly to the GEEMaP program for admittance. In addition to the application materials required by the Graduate College and the applicable participating department, GEEMaP students must also submit:

- A completed GEEMaP appropriate form (http://geemap.stat.uiowa.edu/GEEMaP_application2.html);
- A statement of purpose describing how the candidate's research goals match those of the GEEMaP project, what the candidate's expectation are for the GEEMaP program (e.g. how will they expect the program to enhance their educational experience), and what the candidate believes s/he can contribute to the GEEMaP community;
- Evidence of capacity for quantitative research, originality and creativity, and the application of scientific methods;
- A letter of support from the DEO, DCG or, if known, student advisor, of the department to which the student applied.

Completed application packets must be emailed to the GEEMaP Program Coordinator. Applications will be evaluated twice each year.

Deadlines

February 1: Application packets for all fall trainee appointments are due on either their home department deadline date or February 1st prior to fall enrollment, whichever occurs first. Students who have applied for fall admittance to graduate school and are seeking

an associate appointment also may submit an application at this time. Students applying for trainee and associate appointments by February 1st should expect to hear from the Education and Admissions Committee on or around March 1st. Students who apply for a traineeship during this first evaluation but are not selected will be automatically considered for an associate appointment and need not apply to the second evaluation.

April 15th: Application packets for associates are due on the 15th of April prior to fall enrollment. This application deadline is primarily for new or existing students who do not want to be considered for a trainee appointment. Students applying for associate appointments by April 15th should expect to hear from the Education and Admissions Committee on or around May 15th.

Application packets must be complete before they will be considered for review.

Residence Requirements

Under most circumstances, a minimum of 24 semester hours must be completed after admission to the Program and under the auspices of the University of Iowa. Extramural registration completed after admission may be accepted for residence under specific circumstances. Following the first 24 semester hours of graduate work, a Ph.D. student must complete either (1) two full-time semesters of graduate work (9 or more semester hours each) *or* (2) three semesters of at least 6 semester hours each during which time the student holds an assistantship of at least one-quarter-time which is certified by the Program as contributing to the student's doctoral program.

Conditional Student Status

Potentially successful students not meeting all criteria may be admitted on a conditional basis. Specially tailored additional stated conditions (e.g. taking remedial courses or maintaining a grade point average for a prescribed length of time) must be met by each student to achieve regular student status. Regular admission must be reached within two semesters. Failure to achieve this requirement will result in dismissal. When changing to regular student status, a Request for Change of Graduate College Status form must be completed. This form is available from the GEEMaP Program Coordinator.

Financial Support

GEEMaP Trainees:

GEEMaP IGERT trainees typically receive the first two years of their funding through the NSF grant. During their first year, students will be encouraged to take courses on a broad range of topics, complete coursework required by their department and GEEMaP, and participate in a variety of

research experiences. Second year funding is designed to provide technical or translational experiences beyond the scope of traditional disciplinary training (see Experience section below). It is intended that during these first two years students will construct a solid foundation on which to build the technical, scientific and translational skills and knowledge they will need in future work. An additional three years of funding will be available to students in good standing and making good progress toward their degree as determined by departmental guidelines. These funds will generally be tied to teaching and research assistantships.

Entering GEEMaP trainees will receive the first monthly payment of their NSF stipends on September 1. Their University of Iowa health insurance will go into effect on the same date. Coverage of their tuition and fees is handled as follows. When the trainee registers for classes each semester, a charge for tuition and fees temporarily appears on his or her U-bill. After classes start, IGERT funds are transferred directly to the Graduate College to cover tuition and fees. At that time, those charges are zeroed out on the trainees' U-bills. Questions regarding payment and U-bill charges can be directed to Tammy Siegel, Financial Administrator.

GEEMaP Associates:

IGERT associates will seek funding through departmental and university resources.

Opportunities for Support beyond GEEMaP:

Graduate Research Assistantships. GEEMaP students may be recruited by affiliated faculty members as graduate research assistants (RA) when such positions become available. Typically these are offered by individual faculty, are paid through research grant funding, and may not necessarily correspond to the academic year. Assistantships are available to advanced students who show exceptional research potential. To learn more about RA opportunities, students should contact the individual faculty member.

The privilege of being a GEEMaP trainee means that the funding provided is of a greater amount than that offered through regular RA and/or TA positions. Please see <http://www.grad.uiowa.edu/cogs-contract> Article IX Wages for typical RA/TA salaries for the current academic year.

Graduate research assistantships offered to enrolled students by our faculty are generally 25%-50% appointments (10-20hrs a week). A graduate research assistantship at 25% or more qualifies the student for Iowa resident tuition, a stipend, a partial tuition scholarship, and health insurance benefits.

Research often requires additional expenses that are not paid by GEEMaP traineeships. Graduate research in the experimental sciences (environmental engineering, for example) require financial support for research equipment and supplies that is usually provided by research grants to faculty members. In these cases, students must work closely with their departments and/or research advisors to identify the source of this support.

Note that there are often significant benefits for a student to align themselves with a research grant as soon as possible. In some disciplines, it may be required. The objectives and deliverables of the

research grant can help focus the student's technical training and promote early planning of coursework. It is also common that the research grants will provide the stipends during the years of study where funding is not available from GEEMap.

Teaching Assistantships. Teaching assistantships are a common form of financial aid and available in most departments with undergraduate courses. These assistantships serve two purposes: assistance in the instructional program of the University and the preparation of future college teachers.

In order to qualify for employment as a teaching assistant, students whose native language is not English are required to pass two exams offered by the University: the SPEAK test, a general test of spoken English, and the English Language Performance Test (ELPT), a practice lecture test given to students who pass the SPEAK test. The department will register students for these exams. More information on these exams can be found at www.uiowa.edu/~iiepesl/TAPE/TAPEindex.html.

University-based Fellowships. A limited number of fellowships for PhD candidates are currently available within the Graduate College. These fellowships are awarded competitively based on applications received. Some programs require a sponsoring department to nominate candidates. Examples of university-based fellowships include:

<http://www.grad.uiowa.edu/aid-youre-nominated-for/presidential-graduate-fellowships>
<http://www.grad.uiowa.edu/aid-youre-nominated-for/deans-graduate-fellowships>

Federal Loans. Federal loans are arranged in the University of Iowa's Office of Student Financial Aid. All financial assistance to UI students from general University sources is administered by the Office of Student Financial Aid. For detailed information about loans, grants, scholarships, or part-time student employment, contact the Department of Student Financial Aid, The University of Iowa, 208 Calvin Hall, Iowa City, Iowa 52242-1315; telephone 319/335-1450.

Travel Grants. Money for travel to present at a state or national meeting is occasionally available through the Graduate College or the Graduate Student Senate and should be requested prior to participation in the event.

For more information see:

www.grad.uiowa.edu/aid-you-can-apply-for/supplementary-travel-funding
gss.grad.uiowa.edu/funding/gss-travel-funds-application

University of Iowa Policies Affecting Students

Copies of *University of Iowa Policies Affecting Students* are distributed on campus each fall and are available on the University of Iowa website. Topics addressed include the student bill of rights, standards of academic conduct, treatment of student educational records, policies on sexual harassment, disability policy, religious diversity, and grievance procedures.

Coursework

Students in the GEEMaP program may pursue Ph.D. degrees in Biostatistics, Civil and Environmental Engineering, Computer Science, Geography, Geoinformatics (proposed), Mechanical and Industrial Engineering, or Statistics. To ensure that all GEEMaP students have a grounding in core geoinformatics disciplines, those pursuing degrees in fields other than Geoinformatics will be required to obtain the graduate certificate in Geoinformatics from the Interdisciplinary Graduate Program in Informatics at The University of Iowa (Please see <http://informatics.grad.uiowa.edu/geoinformatics> for certificate requirements).

Second-year students will also be required to take at least one 3-semester-hour course in scientific ethics or social equity. The UI Graduate College is in the process of implementing a new mandatory university-wide research and scholarly ethics training curriculum for all incoming graduate students. This curriculum will include a required four-hour introduction to ethical scholarship and the responsible conduct of research, followed by a series of one-hour workshops and modules, some of which will be discipline specific.

Note that students are strongly encouraged to take coursework beyond the required workshops, appropriate courses includes: Resources and Conflict (Political Science), Geography of Justice (Geography), and Environmental Quality: Science Technology and Policy (Geography) and Ethical Collection and Use of Geospatial Information (Geography). The depth and formality of ethics coursework will be determined by students and their committees.

Coursework during the third year will be largely determined by individual interests and disciplinary requirements.

By the end of their fourth year, students coming with only an undergraduate degree will have completed their comprehensive examination, dissertation proposal and all requirements for practical experience (see Experience section below). Those students entering the program with a Masters degree will reach these benchmarks at the end of their third year.

The fifth year (fourth for students entering with a Master's degree) is the dissertation year. We expect that IGERT trainees and associates will focus on research and writing.

Coursework for Team and Community Building

In addition to foundational coursework, the GEEMaP program is designed to build community and promote an interdisciplinary team-based research approach through mentorship and interaction. To these ends, each incoming student group will move through a sequence of common activities as part of a cohort, so that team-based research projects can better exploit the strengths of diverse academic backgrounds and interdisciplinary connections are established early in their graduate student career. Students will register (while they are in residence) for a one-hour interdisciplinary environmental science colloquium. There will be two elements to this colloquium. Approximately every other week, research presentations will be made by faculty (both from within the University and invited off-

campus guests) and advanced graduate students on current research projects (e.g., conference practice sessions, dissertation proposals). Research presentations will be alternated with informal team-based discussions on topics related to research design, ethics, and implementation, and the translation of research into real-world applications. As experience is gained through coursework, assistantships, and internships, students will bring their own research problems to these meetings to identify, discuss, and, when feasible, address the cross-disciplinary aspects of their own work. To further expose students to related work being conducted at the national and international-scale, a speaker series will also be created to bring in scientists, technologists, and practitioners who highlight the three pillars of our educational philosophy. This series will be open to the university at large and provide state-wide exposure for the GEEMaP program.

Educational Experiences Beyond the Classroom

Each GEEMaP student will rotate through a minimum of two specialty appointments, much as a medical student might rotate through appointments in emergency care, intensive care, and surgery. For GEEMaP trainees and associates, these appointments will be focused on science, technology, and translation. The goal of these rotations is to provide up to three distinct experiences that represent different elements of professional life and offer further opportunity for interdisciplinary interaction. High quality science is a nonnegotiable criterion for successful completion of a GEEMaP degree and, thus, all students must complete a science rotation.

Science Rotations: Science rotations will focus on the epistemology and ethics of good science. They represent a more traditional approach to graduate education and are likely to be the focus of students preparing for academia or basic research supported by the public or private sector. By year three students should be affiliated with individual faculty mentors and focused on their own research directions. Students engaged in their science rotations are likely to serve as research assistants for research teams composed of GEEMaP faculty.

These rotations can be driven by the goals of a specific research grant, self-funded initiatives such as NSF dissertation improvement grants, or simply the research goals of the student. The science rotations will enable the students to put principles of scientific integrity and research ethics into practice under the direction of GEEMaP faculty.

Technology and translation appointments are designed to help students understand the path that good (and sometimes not so good) science takes as it moves from research into practice, expose them to a broad range of real-world experiences, and help them define their own career goals. Students must complete a rotation in translational science *or* technology. Rotations will typically be scheduled during their second year of study, can be completed both on or off campus, possibly in conjunction with international study opportunities.

Translational Rotations: Two kinds of opportunities will exist for translational rotations. Students can work with public agencies responsible for environmental or energy policy and management (e.g., the Iowa Department of Natural Resources) or in outreach service activities associated with a university program, an ongoing research project, or a project of the student's own initiative. Students

interested in a career in the public sector or with non-governmental agencies may elect to concentrate on such rotations.

Technology Rotations: Two kinds of opportunities will also exist for technology internships. In the second year of training, students supported by this grant will provide – under direct supervision of program faculty – consulting services in spatial statistics, dynamic modeling, geographic information science, high performance computing, and other geoinformatics technologies to existing research projects at the University of Iowa. This second-year consulting internship will expose trainees to a broad array of environmental and energy-related research, provide opportunities for them to apply technology to related research activities, and help trainees develop a domain-specific focus for their dissertations. Alternatively (or in addition) students may elect to intern with industry or public agencies engaged in applied research. For example, GEEMaP students will have access to the internship program already existing for graduate students in the Industrial Engineering graduate program in Wind Energy with wind energy companies. Students interested in applied science or work in private research laboratories might focus on such technology rotations.

GEEMaP faculty will help identify student rotations. Additional rotations can be taken and tailored to meet the individual student's interests and career goals.

Advising

All GEEMaP students must have a faculty advisor from the GEEMaP affiliated faculty. Upon admission, each student is assigned an academic advisor. During their first one to two years in the program, it is expected that PhD students will choose a faculty member whose research interests align with their own to serve as academic and research advisor, and chair of the student's thesis committee. This advisor may be the same individual who serves as the student's advisor for the Geoinformatics certificate.

The advisor / advisee relationship requires the consent of both parties and can be terminated by either. If a student wishes to change advisers, the student initiates the change by determining which faculty adviser would be preferred and discussing the possibility with the preferred faculty adviser. Upon approval by the new faculty adviser, the student must then notify the prior adviser and the departmental DGS.. *It should be emphasized that there is no requirement that a student remain with the same adviser throughout that student's academic career and that the reason for change may be personal or because of the student's interests.*

Plan of Study

A *Plan of Study* must be developed in consultation with the student's GEEMaP adviser and the Director of Graduate Studies (or other relevant person) in the home department and filed in the first semester of the student's entry into the GEEMaP program. Once an advisor has been selected, each student in consultation with the advisor will prepare their plan of study. The purpose of the plan is

to ensure that any requested course waivers or transfer credits are approved, the student will have completed the appropriate coursework to receive the degree, and to set important educational milestones to insure satisfactory progress toward the degree is made. It is understood that students entering the GEEMaP program will have diverse backgrounds and expectations. Some students, for example, will enter with a baccalaureate degree, while others will come with a Master's degree, some will enter into a well-established research project with clearly defined goals and expectations, others will define their own research objectives after they have arrived at UI. The Plan of Study should be a realistic assessment of the educational needs of the student, with milestones established that reflect these needs. This plan will be used in part for an annual assessment of student progress.

The Plan of Study should be completed and signed by the student and the student's adviser, and submitted to the GEEMaP program coordinator and reviewed by the Education and Admissions committee. The student and his or her adviser will then be informed if the plan is being returned for modification, or if it is approved. The Plan of Study should be reviewed at least once a year and revised as necessary.

Note that this plan of study must be consistent with plans submitted to participating departments and the Geoinformatics certificate program. An example course schedule for a student pursuing the PhD degree in statistics and the required Geoinformatics certificate is presented in Table 2. This schedule assumes that the student comes with an undergraduate degree. Assuming the 72 hours of required graduate credit for a Ph.D., a minimum of 15 hours is available for discipline-specific coursework (students regularly exceed the 72hr limit).

Table 2 - Sample Schedule for Ph.D. Students in Statistics

Year	Fall Semester	Spring Semester
1	STAT:5090 (22S:170) ALPHA Seminar (1 s.h.) STAT:5100 (22S:193) Statistical Inference I (3 s.h.) STAT:5200 (22S:164) Applied Statistics I (22s:164) (4 s.h.) *STAT:5400 (22S:166) Computing in Statistics (3 s.h.) GEEMaP Seminar (1 s.h.)	STAT:5101 (22S:194) Statistical Inference II (3 s.h.) STAT:5120 (22S:190) Mathematical Methods for Stats (3 s.h.) STAT:5201 (22S:165) Applied Statistics II (3 s.h.) GEEMaP seminar (1 s.h.)
2	[Graduate Core Examination] STAT:6300 (22S:195) Prob. & Stochastic Proc I (3 s.h.) STAT:6990 (22S:197) Readings in Statistics (1 s.h.) STAT:7200 (22S:255) Linear Models (4 s.h.) *GEOG:5070(44:297) Intro. to Geoinformatics, 3 s.h., GEEMaP seminar (1 s.h.)	STAT:6220 (22S:173) Statistical Consulting (3 s.h.) STAT:6990 (22S:197) Readings in Statistics (1 s.h.) STAT:7400 (22S:248) Computer Intensive Statistics (3 s.h.) *GEOG:4500(44:145) Apps in Environ. Remote Sensing (3 s.h.) *STAT:6530)22S:167 Environ. and Spatial Statistics, 3 s.h.) GEEMaP seminar (1 s.h.)
3	[Comprehensive Examination] STAT:7100 (22S:253) Advanced Inference I (3 s.h.) *GEOG:4580 (44:141) Intro to Geog Databases, 3 s.h.) STAT:4520 (22S:138) Bayesian Statistics (3 s.h.) GEEMaP seminar (1 s.h.)	STAT:7101 (22S:254) Advanced Inference II (3 s.h.) STAT:7990 (22S:299) Reading Research (3 s.h.) STAT:7520 (22S:238) Bayesian Analysis (3 s.h.) GEEMaP seminar (1 s.h.)
4	[Prospectus] STAT:7300 (22S:203) Foundations of Probability I (3 s.h.) STAT:7990(22S:299) Reading Research (3 s.h.) *Additional course for Geoinformatics certificate	STAT:7560 (22S:235) Time Series Analysis (3 s.h.) Thesis credits
5	Thesis credits	Thesis credits [Thesis defense]

* indicates course for Geoinformatics certificate; student is assumed to already have had equivalent of CS:3210 (22C:109) and CS:3110) 22C:104.

Retention and Mentorship

Efforts to retain and mentor GEEMaP students will begin prior to their arrival on campus. Each incoming first-year student will be matched with a GEEMaP faculty mentor and a peer mentor who is in his/her second year or later in the GEEMaP program. These mentors will be assigned at the time that the student is admitted to the GEEMaP program so that they can be available by phone and email to assist the student with preparations to live and study in Iowa. By design, the GEEMaP new-student faculty mentors are distinct from academic advisers and play no role in grading or evaluating the mentees' academic work. In addition, GEEMaP efforts to retain graduate students from underrepresented populations will make use of the strong support structures already in place at UI, specifically for women graduate students in the STEM disciplines through WISE, and for students from ethnic minorities through the UI Alliance.

To facilitate interaction with such programs, GEEMaP will cohost the research forum held annually by the Alliance. In addition, the six women GEEMaP personnel (five women faculty and the director of the UI Women in Science and Engineering program) will make special efforts to mentor and retain women students in the IGERT program, including a GEEMaP women's brown bag lunch to be held at least twice each semester.

A GEEMaP social-networking web site is an additional tool for community building and retention and provides a way for GEEMaP students to stay in touch with each other and GEEMaP faculty even while studying abroad, engaging in off-campus internships, interviewing for jobs, etc.

Examination Structure

Comprehensive examinations are the responsibility of the participating departments.

[Biostatistics](#)

[Civil and Environmental Engineering](#)

[Computer Science](#)

[Geography](#)

Geoinformatics (pending)

[Industrial Engineering](#)

[Statistics](#)

PhD Thesis Requirements

Thesis research under GEEMaP must be co-advised by two or more GEEMaP-affiliated faculty members. The primary adviser will be from the student's home department, and the other from a different GEEMaP constituent department.

The student is required to comply with Graduate College guidelines with regard to preparation of the thesis and meeting Graduate College thesis deadlines for graduation. The student should consult the Graduate College or the program coordinator regarding deadlines. The Graduate College *Thesis*

Manual, which provides formatting requirements, is available at Gilmore Hall and on the Graduate College website. Thesis costs are the responsibility of the student, including associated costs such as copying.

Registration

Nine or more semester hours constitutes full-time enrollment during fall and spring semester. A M.S. or Ph.D. student may register for no more than 15 semester hours per semester during fall and spring semester, 8 s.h. during the 8-week summer session, 6 s.h. during the 6-week summer session, or 3 s.h. during the 3-week summer session.

Although total semester hours required for graduation may vary from department to department, at minimum a total of 72 s.h. are required for graduation.

NOTE: International students are subject to registration requirements in addition to those listed above. They are generally required to be registered full-time (at least 9 s.h.) in fall and spring semester, and there are restrictions on the number of courses they are allowed to register for via distance learning, e.g. web classes. International students should contact the Graduate Program Coordinator and/or the Office of International Students and Scholars (OISS) if they have questions about registration requirements in specific situations.

To register, students must first meet with their academic advisor to discuss and plan their coursework. Once this discussion has taken place, each student should contact the Program Coordinator to authorize their registration.

Petitions for Waiver of Coursework

GEEMaP course requirements are limited to the interdisciplinary colloquia discussed above. Students who wish to waive such a requirement may petition the Education and Admissions committee. A waiver means that the student is not required to enroll in the course, and the student does not receive credit for the course. Waivers for courses in participating Ph.D. programs or the Geoinformatics certificate program must be submitted directly to those programs.

Transfer Credits

Students with prior graduate coursework can request the transfer of some of these credits to reduce the total semester hours required for their graduate degree. Cases are considered on an individual basis. Transfer credits cannot violate Graduate College residency requirements. Students wishing to transfer credits should submit a petition to the GEEMaP program assistant.

Petitions must include information about the course (institution, course title, number of credit hours and grade) and a course description sufficient to determine which of our courses the transfer replaces. Transfer requests are then evaluated by the appropriate faculty and the Program's Education and Admissions committee. Transfer credits from other colleges and universities are also evaluated by the Graduate Admissions Office. GEEMaP cannot approve transfer hours from other institutions unless Graduate Admissions awards graduate credit hours.

Academic Standing

While pursuing a degree, students are expected to maintain a 3.33 or better grade-point average. A student with less than a 2.75 G.P.A. after 8 or more semester hours of graduate work will be placed on probation by the Graduate College. Refer to Sec. IV. of the *Manual of Rules and Regulations of the Graduate College* for details on probation and dismissal standards, procedures, and appeals.

Any GEEMaP student who receives more than six semester hours of C+ or lower on core and required courses, including any transfer hours, will be dismissed from the program. Any student who does receive more than six semester hours of C+ or lower may appeal the dismissal in writing to the head of the Program. Student appeals must be voted on by the Program faculty within two semesters, including summer session, from the end of the semester in which the last C+ or lower grade was received.

Responsibilities of GEEMaP Students

GEEMaP trainee status entails particular responsibilities to the program. These are described in the GEEMaP Trainee Agreement in the Appendix.

Core Course Requirements

Please see requirements for the applicable programs:

[Biostatistics](#)

[Civil and Environmental Engineering](#)

[Computer Science](#)

[Geography](#)

Geoinformatics (new degree program; not yet open for application)

[Industrial Engineering](#)

[Statistics](#)

General Information for Students

Writing Center

It is strongly recommended that students use the resources of the University's Writing Center. The

Center offers a variety of free services, including regularly scheduled sessions with a writing tutor, one-time sessions with a tutor, and an e-mail tutoring service for three-day feedback on a student's work. The Writing Center is located at 110 English-Philosophy Building (EPB), 335-0188.

Computer Lab

University computer labs (ITCs) are available throughout campus. A complete list of available ITCs can be obtained through the University's Information Technology Services Office.

Forms

Most of the forms GEEMaP students will use are available electronically on the Graduate College website.

E-mail accounts and Mailboxes

Every student should apply for a university e-mail account upon enrollment. The student will then be connected to the GEEMaP LISTSERV as part of the Informatics Student Group e-mail list . This e-mail list is the most efficient way students receive information such as seminar announcements, job announcements, program information, etc. E-mail messages should be checked regularly.

Websites

An electronic version of this manual, forms commonly used by students, and significant dates for students are available on the GEEMaP Program at geemap.stat.uiowa.edu. The Program and college website also contain general information of interest to students, including an event calendar which includes seminars and other program events.

The University of Iowa website (www.uiowa.edu) offers many other resources for the student. Particularly useful are the ISIS registration system site, the Graduate College Handbook site which offers valuable information and advice about the Iowa City area and University of Iowa resources, and the website for the *Manual of Rules and Regulations of the Graduate College*.

Appendix A

GEEMaP Faculty and Staff

Director

Mary Kathryn Cowles, Associate Professor, Statistics and Biostatistics

GEEMaP Faculty

Marc Armstrong, Professor and CLAS Collegiate Fellow, Chair Geography

David Bennett, Professor, Geography

Christine Brus, Director, UI Women in Science and Engineering

Keri Hornbuckle, Professor, Civil and Environmental Engineering

Andrew Kusiak, Professor, Mechanical and Industrial Engineering

Philip Kutzko, Professor, Mathematics

Marc Linderman, Assistant Professor, Geography

George Malanson, Coleman-Miller Professor, Geography

Sara Mitchell, Associate Professor, Political Science

Athanasios Papanicolaou, Robert and Virginia Wheeler Faculty Fellow of Engineering, Professor,
Civil and Environmental Engineering Marc Armstrong, Professor and CLAS Collegiate Fellow,
Chair, Geography

Gerard Rushton, Professor, Geography

Jerald Schnoor, Allen S. Henry Chair in Engineering; Professor, Civil and Environmental
Engineering; Co-Director, Center for Global and Regional Environmental Research

Alberto Segre, Professor and Associate Chair, Computer Science

Brian Smith, Associate Professor, Biostatistics

Padmini Srinivasan, Professor, Computer Science and Management Science

Kathleen Stewart, Associate Professor, Geography

Dale Zimmerman, Professor, Statistics

Steering Committee

Mary Kathryn Cowles, Associate Professor, Statistics and Biostatistics

Andrew Kusiak, Professor, Mechanical and Industrial Engineering

Kathleen Stewart, Associate Professor, Geography

Athanasios Papanicolaou, Robert and Virginia Wheeler Faculty Fellow of Engineering, Professor,
Civil and Environmental Engineering Marc Armstrong, Professor and CLAS Collegiate Fellow,
Chair, Geography

Education/Admissions Committee

David Bennett, Professor, Geography

Alberto Segre, Professor and Associate Chair, Computer Science

Philip Kutzko, Professor, Mathematics

Keri Hornbuckle, Professor, Civil and Environmental Engineering

Sara Mitchell, Associate Professor, Political Science

Trainee Agreement
Geoinformatics for Environmental and Energy Modeling and Prediction
NSF IGERT program at The University of Iowa

I commit to fulfilling the PhD requirements of my department and of GEEMaP.

I understand that, once I have been funded by the National Science Foundation as an IGERT trainee, I will continue to be a trainee for the duration of my graduate studies in GEEMaP. My responsibilities as a trainee will continue after the two years of NSF funding have ended.

Each year, I will submit my online trainee survey on time as part of the GEEMaP annual report to the National Science Foundation. I understand that, if any NSF surveys from trainees are missing or late, NSF will not release any GEEMaP funds for the next year.

I will also respond to the surveys sent each year by the GEEMaP external evaluator, Mack Shelley, for the purpose of evaluating and improving the GEEMaP program.

I will serve as a mentor for at least one future GEEMaP first-year student.

If elected by my peers, I will serve as a student member of a GEEMaP committee for at least one year. In the GEEMaP administrative structure, trainees may serve on the steering committee and the recruitment/retention committee.

I will participate in GEEMaP outreach and recruitment activities, including speaking to high school and undergraduate student groups.

Signed: _____

Date: _____