

Department of Geography, University of Delaware Graduate Program Policy Handbook

Table of Contents

<u>INTRODUCTION</u>	<u>2</u>
<u>REQUIREMENTS FOR THE MASTER'S DEGREES</u>	<u>4</u>
<u>REQUIREMENTS FOR THE PH.D. DEGREE</u>	<u>7</u>
<u>FORMAT OF MASTER'S THESIS OR DOCTORAL DISSERTATION</u>	<u>11</u>
<u>ANNUAL REVIEW</u>	<u>12</u>
<u>FUNDING</u>	<u>12</u>
<u>ETHICS, RULES, PROBLEMS</u>	<u>14</u>
<u>GRADUATE STUDENT SERVICE AND ACTIVITIES</u>	<u>15</u>
<u>RESOURCES</u>	<u>16</u>

Introduction

Rules, Policies, Guidelines, and Exceptions. This document contains a mixture of University of Delaware rules and Geography Department policy and consensus advice of the faculty of the Geography Department, intended to guide students seeking a graduate degree through the required steps. The definitive rules regarding these degrees are found in the *Graduate Catalog* and other policy and deadline notices from the Office of Graduate and Professional Education (called the “Graduate Office” in most of the rest of this document). Each student is responsible for conforming to the rules published in those other documents. This policy document does not recapitulate all the details of the requirements, time limits, thesis formats, and so forth contained in the documents from the University and the Graduate Office. Any disagreement between this document and the Graduate Office or Graduate Catalog requirements will almost certainly be resolved by deferring to the Graduate Office and subsequently editing this document to bring it back into compliance.

Official regulations (URLs subject to change):

Office of Graduate and Professional Education:

<http://www.udel.edu/gradoffice/>

Application Procedures:

<http://www.udel.edu/gradoffice/apply/>

Thesis and Dissertation manual:

<http://www.udel.edu/gradoffice/forms/thesismanual.pdf>

UDThesis Styles:

<http://www.udel.edu/topics/udthesis/>

Some elements of this document are *policies* of the Geography Department, as opposed to guidelines or suggestions. These are expectations regarding such items as the normal composition of a thesis advisory committee and requirements for examinations and presentations. Most of the rest of the document is advisory only, although we regard this advice as very important. Whenever the imperative level of any piece of information is not obvious, please ask your adviser, department staff, or department administration for clarification.

Each individual student in all of our degree programs will work on a unique thesis problem after arriving with a unique background and engaging in a distinctive set of courses. Occasionally a rule becomes redundant or inappropriate for a particular thesis program. Students may request *exceptions* to rules. Exceptions are granted on a case-by-case basis. Departmental exceptions require a request supported by the adviser and approved by the Chair, in consultation with other departmental faculty members.¹ University exceptions require a request from the Department to the Graduate Office. The Graduate Office may make an immediate decision or may consult with other authorities as well. Appeals at either level are always possible, but will generally be considered only with additional information.

Degree Programs. Graduate studies in Geography at Delaware lead to Master of Arts (M.A.), Master of Science (M.S.) degree and the Doctor of Philosophy (Ph.D.) degree in Geography. Our

¹ Department governance is described in its Bylaws, available along with other departmental documents at http://provost.udel.edu/college_department_and_program_documents. In most situations, the Chair makes decisions intended to follow a consensus of the faculty, consulting with the faculty as needed.

master's (M.A. and M.S.) programs in Geography reflect a tradition of breadth and flexibility, with the advice of and close supervision by a primary adviser and a thesis committee. A required, original research thesis is the capstone achievement of every degree program. The goal of our masters program has been to prepare our graduate students for admittance to Ph.D. programs here and elsewhere, or for meaningful employment in the private or public sector and in K-12 education. The goal of our Ph.D. program has been primarily to prepare students for academic careers in higher education and research, but this has not been the only career track chosen by our graduates.

Human geography students in the M.A. or the Ph.D. in Geography study one of several aspects of human, cultural, or environmental geography. Physical geography students in the M.S or the Ph.D. in Geography pursue topics in physical geography, including land-surface processes, ecohydrology, and cryosphere and climate studies, and the interactions among those areas. Any of the degrees in Geography may encompass topics that cross into both the human and physical environment and their interactions, which examines linkages and processes between the biophysical environment and human societies.

Our students are expected to master skills as needed to be self-sufficient in the research methods required for their thesis areas. This may require courses or individualized study in remote sensing, geographic information science (GIS), cartography, qualitative analysis, archival research, use of electronics and instrumentation, mathematics, statistics, numerical methods, or computer programming. At the master's degree level, some students have come to the program with a primary interest in a technical area, such as GIS or remote sensing, and a secondary interest in some subfield of geography or climatology. We have been able to accommodate such interests within the master's programs, but these are primarily geography programs, and a topical thesis is always required.

Entrance requirements. Admission to the master's degree program nominally requires an undergraduate grade-point-average of 2.75 or more and combined (verbal plus quantitative) GRE scores of at least 300. Admission is selective and competitive based on the number of well-qualified applicants and the limits of available faculty and facilities. Those who meet stated minimum academic requirements are not guaranteed admission, nor are those who fail to meet those requirements necessarily precluded from admission if they offer other appropriate strengths. The department will consider qualified applicants without previous background in geography, although additional preliminary work may be required.

Students are only considered for the Ph.D. in Geography with a completed master's degree that includes a thesis. Admission decisions based on a pending master's degree are always considered probationary until the master's degree is completed. A combined GRE score of at least 300 is also expected, and the undergraduate record will be examined, but the focus in Ph.D. admission is on the quality of work at the master's level. The department does not allow a direct track to the Ph.D. following the bachelor's degree. Most Ph.D. students enter from master's programs in geography, geology, atmospheric sciences, oceanography or environmental science. Students from other related disciplines are encouraged to apply, and students who are not sure of the appropriateness of their background are encouraged to consult with the Chair or a faculty member in the area of interest before applying. All applicants will be judged on the basis of both the quality and the range of their education, and the topical compatibility with areas of research by potential advisers.

Students applying to the Geography Ph.D. program should make clear in their application statements whether they wish to follow a physical, human, or coupled human-environmental geography track. Applicants must demonstrate their preparation in methodological techniques appropriate to their particular interests. Additional preparation may be required following admission and prior to undertaking a research program. For any graduate admission, but especially for the Ph.D.'s, the applicant's research interests must show topical compatibility with research areas of potential advisers.

Students completing a master's degree within Geography or another unit of CEOE who wish to continue towards the Ph.D. must submit a Change of Classification Form to enter the Geography program. The faculty will evaluate these as they are received, without particular deadlines. Students completing a master's degree in the geography department who wish to enter a different Ph.D. program at UD, or students completing other masters degrees from UD who wish to enter our Ph.D. program, must complete a regular admission application as if entering the program from outside UD.

After graduation. A goal for many masters' students is to continue into our Ph.D. program—a route taken by roughly one-quarter of our masters' graduates. Accounting for M.S. and M.A. graduates, over a third of our master's graduates enter a Ph.D. program, usually with an academic career in mind. Our Ph.D. graduates have been particularly successful in the academic sector, many becoming professors in Ph.D.-granting departments at major universities, as well as at regional universities. A number of Ph.D. graduates have found employment in federal research labs and private industry, including environmental services contracting companies and information technology fields.

Masters students who seek employment directly after graduation instead of further education have found employment with federal agencies, especially in areas that use geographical analysis techniques, as well as many private sector companies that need environmental, spatial, and especially GIS training. With growing demand for both the topical and computer skills our students acquire (including GIS), we anticipate that the number and quality of employment opportunities for our graduates will continue to increase.

Requirements for the master's degrees

Course requirements. Students in either the Master of Arts or Master of Science program complete at least 24 course credits. Graduate courses at the University of Delaware include any courses numbered 600 or above. (The special thesis research courses, 868 and 869, are not counted in these 24 credits.) All of these courses must be taken for a letter grade unless the course is only offered on a pass/fail basis. Courses applied to a graduate program must be completed with a Grade Point Average of 3.00 (B average) or better, and only courses in which a grade of C– or better is received will count towards a degree. A maximum of nine credits may be transferred into the program with the permission of the department. These transferred courses may include courses taken at another university, Continuing Education courses taken at the University of Delaware before admission to the graduate program, or courses that qualified for graduate credit but were taken while still an undergraduate, so long as those courses exceeded the requirements of the undergraduate degree.

Students regularly take undergraduate courses while enrolled in a graduate program, most often in mathematics or methodological techniques. Undergraduate courses do not count in the student's graduate GPA, nor do they count toward the minimum full-time requirements that are attached to various funding sources. Any such courses taken as a master's student in order to fulfill the requirements for later admission to our Ph.D. programs should be taken for letter-grade credit.

An individualized determined curriculum is developed for each student, and the advisory committee evaluates whether the given suite of courses sufficiently prepares a student for the master's thesis.

Thesis Credits. Each student must enroll in at least six credits of *GEOG869 Master's Thesis*. These credits are over and above the 24 credits of regular courses required. All six credits may be taken at once or, more commonly, they may be taken a few credits at a time during more than one semester. During the thesis research, the student's adviser will assign a grade of S or U at the end of each semester, and then will change these to a letter grade at the completion of the thesis.

Once a student has completed all course credits and Master's Thesis credits required for the degree, the student should typically change to sustaining status. If a student needs additional credits only to maintain full-time status, *GEOG868 Research* may be taken for up to nine credits per semester. *GEOG868* is graded pass/fail only.

Required Courses. Graduate students entering the Geography graduate-degree program for the first time are expected to take a one-credit course, *GEOG600*, which primarily serves as an introduction to this department, to the nature of a thesis, and to graduate study and professional geography in general. No other specific courses are required of all students in the Geography graduate degree programs. The advisory committee determines whether a given suite of courses sufficiently prepares a student for the master's thesis. The mere completion of 24 graduate credits is not necessarily sufficient. Particularly in those cases where a thesis topic or adviser changes during the program, additional coursework will be required if the advisory committee deems it necessary. Early and regular consultation with an adviser is necessary for planning each student's curriculum.

The Master's Thesis. The master's thesis must show ability to conduct scholarly research and to report the results at a publishable quality. A well-crafted master's thesis can be a source for publications that will help obtain Ph.D. admissions and funding, a source of ideas for Ph.D. dissertation topics, an ongoing source of personal pride, and a springboard for a future career. However, none of the characteristics that describe a good master's thesis can be put down in words that apply to all thesis research topics. There is no minimum page limit, no minimum number of references, no standard order of chapters and chapter titles, or any other such specific limitation. Rather, the definition, guidance, and eventual acceptance of a master's thesis rely almost entirely on the judgment of the advisory committee.

The Committee. An advisory committee consisting of at least three members will evaluate the program of courses and the thesis. (The department may approve larger committees, but three members is the most common size.) The most important member of the committee is the professor in charge of the thesis, generally called the adviser. An adviser is established by the combination of choice of the student and agreement of the adviser, usually before a thesis topic is completely worked out. The adviser will help refine the topic and choose other members of the committee. The adviser should have established a record of scholarship in the field of the thesis. The adviser is a member of the faculty of the department, including those who hold secondary faculty appointments

within the department. Faculty who have retired or resigned from the university may continue to chair committees of students whose work began under their direction before their retirement or departure from the university.

One of the other members of the committee will be another member of the faculty of the department. The third member will be external to the department—most often a faculty member from another department, but occasionally a faculty member of another university or a qualified professional who is not on the faculty. The department must approve the committee, and this approval will include judging whether members who are not on the faculty of the University of Delaware are appropriate for this role. Because the formal approval consists of the signature of the Chair on the Application for Advanced Degree form, it is essential that any nonstandard or exceptional committee member be discussed with the Chair when the committee is being formed.

All three members of the committee should be able to serve both as advisers during thesis research and evaluators of the quality of the final product. The extent to which committee members other than the primary adviser guide the research varies greatly from project to project, but it is in the student's interest to bring the other committee members into the research as early and as fully as practical.

The committee determines whether and when the thesis has achieved the level of scope, originality, and quality necessary for a master's degree. Acceptance of the thesis requires the signatures of all members of the committee. Additionally, the signature of the Chair of the Geography Department indicates acceptance, on behalf of the entire department, of the membership and activities of the advisory committee. The thesis must also be signed by the Dean of the College of Earth, Ocean, and Environment and by a representative of the Provost. Names and titles of signers above the department level vary regularly, but must be correct for the semester in which the degree is actually granted. Please check with department and college staff for assistance regarding the department's signature memo, correct names and titles needed on the signature pages for higher-level administrators, and other forms that may be required to complete the degree.

The Presentation. After the adviser and committee members agree that a draft is sufficiently complete, the student will present the results of the thesis to the department. This presentation is in the style of the various seminar series around the university, in which a presentation of 30 to 45 minutes is followed by questions from the audience. (This is in contrast to the style of a Ph.D. dissertation defense, in which formal questioning led by the advisory committee follows a presentation.)

In some cases, the presentation will be of a thesis that is essentially in its final form and already approved by the committee. In other cases, the committee may use the presentation and the questions that arise during the presentation to guide their advice on completion of the thesis. Whether the thesis presentation should be viewed as a final presentation of a complete work or as a tool for guiding the final work on a nearly complete thesis is up to the adviser and committee.

Timetable for the Master's degree. Individual variation from the following timetable is expected. However, the goal of our students and faculty is that a full-time graduate student will complete the master's degree in two years. The following schedule provides a reasonable way to adhere to that two-year goal, with all in-house activities completed by the end of the fourth semester. Students who take full-time course loads during their first year and who identify an adviser and topic early in that year may find that their second year can be devoted entirely to thesis work, allowing faster

completion than this schedule indicates. Students with teaching or research assistantships who take the minimum six credits per semester will find it difficult to adhere to this schedule.

- At time of matriculation, meet with Geography Department Chair and potential advisor(s) to discuss proposed plan of study and outline selection of courses to complete.
- First two months: Meet all faculty members; reduce potential advisers to a short list.
- By first winter session: Choose adviser, spend winter session exploring thesis ideas.
- Second semester: Prepare preliminary proposal for thesis, conduct library research, and choose remaining committee members.
- Summer after first year: Begin thesis research – primary data collection for some field projects may need to be completed during the first summer; finish library research.
- Third semester: Complete regular courses; continue with thesis research. Check current regulations and deadlines for submitting an Application for Advanced Degree form, which will generally be required a full semester in advance of the intended graduation date.
- Fourth semester: Complete research, complete draft of thesis, and prepare presentation of thesis after committee approval of draft.
- Second summer: Complete final editing and changes in response to committee and public suggestions. Prepare clean, final version for Graduate Office according to current University of Delaware specifications. Submit thesis PDF and signature pages to the Graduate Office.

The university stipulates a time limit of five years from entry into the master's program until completion.

Requirements for the Ph.D. degree

For the Geography Ph.D. degree, at least three academic years of graduate academic work beyond the masters' degree are normally required. Students are expected to be in residence (enrolled full-time) at least two continuous years beyond the master's degree. The definitions of graduate courses and limits on transfers discussed at the beginning of the master's degree section also apply to the Ph.D.

Course requirements. Students are expected to acquire general knowledge of the discipline of geography consistent with what would be expected of a faculty member in a geography department, along with specialized knowledge of both a topical area of research and technical method and research skills needed to carry out independent research in the topical area. While there are no minimum numbers of courses, roughly half of the courses applied to the Ph.D. program should be in topical areas related to the chosen subfield of geography, and the other half should be in methodological areas needed for research in the chosen area.

Upon matriculation of a student, the Geography Department Chair and the potential advisor(s) will begin to develop the proposed plan of courses, individually developed. Determining that a suite of courses adequately fulfills these requirements is one of the roles of the advisory committee. The committee will determine if the student has adequately understood these areas, over and above the evidence of the transcript, during the comprehensive examination typically taken in the second year of the program.

Dissertation Credits. Each student must enroll in at least nine credits of *GEOG969 Doctoral Dissertation*. Enrollment for these credits is allowed only after achieving candidacy status (see below). *GEOG969* will be given a temporary grade (S or U) at the end of each semester, and a final grade will be submitted for the dissertation after completion of the defense. Precandidacy students needing credits to maintain full-time status for funding purposes may take *GEOG964 Pre-Candidacy Study* for a variable number of credits, pass/fail. Following completion of all requirements except the final dissertation, including the comprehensive examination and dissertation credits, a student may enter sustaining status.

The Dissertation. As with the master's thesis, the requirements for a doctoral dissertation are intangible—not based on quantifiable limits. The most important role of any advisory committee is judging when a body of work has become a sufficient doctoral dissertation. The dissertation must be original research, largely carried out by the candidate. Close collaboration with an adviser is normal, but leadership in research and clear intellectual contributions by the candidate must be visible. The dissertation must be based on original research and make a significant contribution to knowledge—it will not be based solely on literature review but will include new data collection, data analyses, experimentation, or modeling. A typical understanding of “contribution to knowledge” is that the dissertation reports on work suitable for publication in high-quality, refereed journals.

Because academic positions are a common goal of Ph.D. students, the dissertation forms an important foundation for the entire career. The dissertation usually provides the core of the first few papers by an assistant professor, the basis for early funding proposals, and the initial research direction that will be taken during the early part of the academic career. A well-chosen dissertation topic that leads to useful, positive, publishable results and to topics for further research is essential to building a successful career. Dissertation research is usually presented as part of an interview for entry-level faculty positions, and the potential for a successful assistant professorship working from the foundation provided by the dissertation research will be an important factor in faculty hiring decisions. A poorly chosen topic or minimal effort towards finding positive and useful results will have life-long career consequences.

The Dissertation Committee. An advisory committee consisting of four to six members will evaluate the program of courses, the examinations, and the dissertation. The adviser, who is usually chosen before a thesis topic is worked out, chairs the committee. The adviser will help refine the topic and choose other members of the committee. The adviser should have established a record of scholarship in the field of the thesis

For the Geography Ph.D., the adviser will be a member of the faculty of the Geography Department. The definition of faculty includes those who hold secondary faculty appointments within the department or program. Faculty who have retired or resigned from the university may continue to chair committees of students whose work began under their direction before their retirement or departure from the university.

The committee will contain a minimum of three additional members. One will be another member of the Geography faculty in an area close to the research area. Another will represent the secondary area of study, usually the methods or technical area of study, and one will be an external member. The external member may be from outside the University in order to broaden the perspectives of the committee, or the external member may have a primary appointment in a University of Delaware department outside of the Geography faculty. The external member is a

full, voting member of the committee. External members from outside the University of Delaware should be chosen with an eye to the willingness and practicalities of having such a member either present or electronically connected during the oral comprehensive exam and the defense.

Our program recommends a committee of five: the adviser, two additional members from within the program, a University of Delaware faculty member from within the methods or techniques area, and an external member as defined above. The Chair of Geography approves the composition of the advisory committee on behalf of the participating faculty. As with the master's committees, this approval comes late in the process, so discussion with the Chair is important for any nonstandard composition of a committee. The Chair's signature on the final dissertation is taken to mean approval of the committee and its procedures by the department or program, rather than approval of the content of the dissertation itself.

Occasionally, during the lapse of time between the comprehensive exam and the final defense, changes in the job status of committee members (including sabbatical leaves) or metamorphosis of the dissertation topic may require or suggest changes in the committee. This will be acceptable, so long as the committee at each stage satisfies the requirements for a dissertation committee.

The Doctoral committee strives to achieve consensus concerning the student's performance and quality of work. In the case of dissenting votes, the majority opinion rules and a majority vote in favor is needed for successful completion of comprehensive exams and the defense. In a committee with an even number of members, a "majority" required for passing or approval at any stage must include more than half of the members, not just exactly half of the members.

Comprehensive Examinations. Three major examinations are required for the Ph.D. program: written and oral examinations undertaken before the dissertation research is complete, and a final oral defense of the completed dissertation. The *written and oral comprehensive examinations* for the Geography Ph.D. are considered to be two different parts of the same examination. The *written* portion of the comprehensive exam is undertaken first. The adviser will solicit questions from the rest of the advisory committee to be administered by the Geography Department. Normally, these questions will cover the topical area of that committee member, such as information from the graduate courses taken by the student from each committee member, or background information needed for the general area of the dissertation research that the committee member feels is most important. The member who generates a question also sets the conditions of the exam for that question (open book/closed book, use of computers, time limits). Members of the committee other than the adviser will usually each require no more than three hours of writing during the written exam, but more time may be expected with advance warning.

The *oral* portion of the comprehensive exam will be scheduled within a month of the written portion. The oral comprehensive exam is private—only the committee and the candidate attend. No formal rules govern the format of this exam, but commonly, a short (20 to 30 minute) presentation of the intended dissertation research by the candidate precedes questioning. Questions from the committee may be on anything relevant to the student's past training and future research plans. The oral exam is sometimes used to follow up on questions from the written examination, seeking clarifications or amplifications. Questions in the oral exam typically focus on the proposed dissertation research. The committee members may use this opportunity to seek clarifications, suggest modifications, or deduce whether the candidate is properly prepared to engage in the proposed research.

Although the written and oral portions of the Geography Ph.D. comprehensive exam seem separate and may be weeks apart, they are considered two aspects of the same exam. Each committee member will register a “pass” or “fail” for the entire, combined examination. A passing grade by a majority of the committee admits the student to doctoral candidacy, conferring a change of status and eligibility to take dissertation credits. A committee member may also register a “conditional pass” in which a passing vote requires satisfying some additional piece of work, such as studying a particular topic and demonstrating improved understanding.

If a candidate does not receive a majority of passing votes, then permission to retake the comprehensive exam can be given if approved by a majority of the committee only once. At that time, the committee may specify that only the written or oral portion need be retaken, or they may specify that the entire exam must be retaken. If the student fails the comprehensive exam given permission to retake, then the recommendation for dismissal will be granted to the Graduate Office.

Conditions common to the Ph.D. Comprehensive Examinations. Because much of the oral comprehensive exam centers on the proposed dissertation topic, it is normal to have a formally written dissertation proposal circulated to the members of the committee well in advance of the comprehensive examinations. Commonly, this proposal will have a statement of the problem, a literature review that might be an early draft of the dissertation’s literature review, a description of research methods, data sources or experiments that will be undertaken for the dissertation, and some expected results.

The timing of the comprehensive exam is often controlled by the readiness of the dissertation proposal. The exam may not be scheduled before the end of first year in residence (but no student in the history of the program has come close to violating that rule). The exam should not be scheduled before a topic has been studied sufficiently to show that a topic is interesting, useful, and plausible. The proposal should show that necessary data will be obtainable and that the research methods are practical.

However, the committee should not be presented with a proposal that is nearly a first draft of the dissertation, on which suggestions and input seem too late to be relevant. The ideal time for a comprehensive examination, when ideas for the dissertation are well thought out but not yet ossified, will often need to be compromised by the availability of the committee members to meet at one time and location for the oral exam.

An important element of a successful comprehensive exam is communication with the committee members, preferably months in advance. Committee members may suggest readings or subjects to review and outline the general areas that they will cover with their questions. Provide committee members with a proposal far enough in advance to allow discussion before the exams, and ask for feedback on the written examination answers before the oral exam. Committee members may choose to give no information whatsoever before exams, but most would rather deal with a prepared candidate than a surprised candidate.

Rules and traditions for the comprehensive exams vary widely among departments and universities. Communication with external members about roles and expectations of the committee members may be taken care of by the adviser, but it is in your interests to make sure that communication happens at that level as well.

The Dissertation Defense. After the advisory committee has been presented with a complete draft of the dissertation, with all the elements and quality of a final version including all graphics, tables, references, and preliminary parts, a defense of the dissertation should be scheduled. The

defense includes a public presentation of the dissertation research and an opportunity for public questioning. The committee may also choose to hold some of the questioning in closed session. Students can gain a perspective on the format and tone by attending defenses during their time in residence.

The advisory committee must have the dissertation in hand at least two weeks before the defense. The degree of collaboration with committee members will vary. Some dissertations are done completely independently, with even the adviser only serving as first editor for completed chapters. More commonly, a considerable degree of collaboration exists among the candidate, the adviser, and one or two of the committee members. Some members will wish to see chapters as they come out, and some will prefer to only see the final dissertation just before the defense. As with the written and oral examinations, communication is important. It is to the candidate's advantage to have more committee members than just the adviser be familiar with the evolution of the project since the comprehensive examinations.

The advisory committee will convey minor editorial suggestions to the candidate at the defense. Committee members can also request substantial changes in a dissertation and make the final passing vote contingent on seeing the revised work.

When a majority of the advisory committee agrees to a passing vote for the dissertation defense, the candidate is responsible for making a final version of the dissertation in the required format (currently, the Graduate Office requires PDF), printing signature pages on the required paper, obtaining signatures from the committee members and the Geography department chair, and getting these to the Graduate Office, along with various forms and fees. The UD Bookstore offers thesis binding for additional copies, if desired.

Timetable for the Ph.D. Ph.D. programs are necessarily more variable than master's programs. Students moving into the Ph.D. program from our geography masters program will often have few additional courses to take, whereas students entering from master's programs in related fields may need two years or more of full-time coursework to be properly prepared. Ph.D. students may look over the timetable given for the master's degree, but development of a Ph.D. thesis topic will be a much more substantial effort. The tradition of generating a formal proposal for the oral exam and the overwhelming importance of making a good choice of a dissertation topic simply require more time. In addition, research on the Ph.D. thesis is at least one year of full-time work. Very roughly, an entering Ph.D. student may expect to spend an additional year taking courses and exploring dissertation ideas, half a year refining the proposal and preparing for the comprehensive examination, and one to two years in the research and writing of the dissertation. The Ph.D. degree is also subject to a university-specified time limit of five years following the master's degree.

Format of Master's Thesis or Doctoral Dissertation

The Office of Graduate Studies regulates the physical characteristics of the final copies of theses, including criteria for margins, page layout, typography, and the content of the preliminary pages. The thesis must comply with all of these regulations at the time the final copies are submitted. The *Thesis and Dissertation Manual* is available online. The Information Technology User Services group on campus maintains template or macro packages, known as *UDThesis*, designed to provide thesis-style formatting in a few word-processing or text-formatting packages.

Theses must be in American English and must be literate and well written. Many readers, including perhaps the committee, will equate the quality of the ideas with the quality of their expression—if prose is jumbled and disorganized, then ideas and interpretations are probably also suspect. Scientific units and mathematical text have special typographical rules and conventions. Documents summarizing the U.S. National Institute of Standards and Technology views on use of units and mathematical typography may be obtained from <http://physics.nist.gov/cuu/units/rules.html>.

Because of the wide range of topics covered in the Geography Ph.D. degree program, we do not enforce the citation style and reference style of any particular organization. Commonly, theses will follow the reference style of the *Annals of the Association of American Geographers* or the journals published by the American Meteorological Society or the American Geophysical Union, but other styles can and have been used. The adviser will typically suggest either a particular journal or recent thesis to emulate in reference style. The references must be complete and consistent within the thesis.

Annual Review

Each winter, both masters and doctorate graduate students are asked to summarize their academic activities for the previous year on a form provided by the Geography Department. These reports are reviewed by the department's Academic Council. With the input of the student's adviser, a response with consensus advice of the faculty is provided to the student. The review serves as an adjunct to the adviser/student relationship and it provides the department and program with useful information regarding the progress of our students.

Upon the determination by the faculty that a student is not making adequate progress towards meeting their degree requirements, the recommendation may be granted to the Graduate Office for academic dismissal.

Funding

Funding types. The department tries to fund as many as possible of its full-time graduate students at a level that enables reasonable subsistence in the Newark area. Stipends do not vary with experience level or type (RA, TA, or university-generated fellowship). University-generated fellowships and assistantships are provided with full-time graduate tuition. In addition, the department makes office space available to all funded graduate students.

Fellowships carry no departmental work obligation. Some are controlled by the department or program to assign as it sees fit. The Graduate Office supervises competitively awarded fellowships of three types: for any outstanding graduate student, for Ph.D. students who have passed into candidacy status, and for students from challenging circumstances. Nominations for these must come from the department, not from the individual student, and the department is limited in how many nominations it is allowed to make. The department selects nominees carefully, based on perceived chances of success when compared to students from other disciplines.

Delaware Space Grant fellowships are also available each year across the University targeting those students contributing to the mission of NASA. Nominations for these come from the department, but students are able to apply without a department nomination.

Holders of university-based fellowships must maintain full-time graduate student status by taking at least nine graduate credits. Although no departmental work obligation is required, holders of fellowships should engage in the usual level of departmental service.

Teaching Assistants provide 20 hours per week of work (on average) in the department's educational mission. Assignments each semester are based on departmental needs, student experience, and student schedules. Under the supervision of a faculty member, TAs may teach labs, prepare exercises, assist in gathering instructional materials, grade assignments and tests, proctor exams, run tutorial and review sessions, and hold office hours. Flexibility on the part of both TA and faculty supervisor is expected, in that assignments may vary greatly from week to week depending on the work being done in a course; TAs also have varying obligations to the courses they are taking for credit. Full-time status for a TA requires taking at least six graduate credits per semester.

Research Assistants provide 20 hours per week of work on a funded research project under the supervision of the principal investigator (the faculty member who obtained the grant under which the project is funded). As with TAs, RAs are expected to be flexible about workloads, which may vary greatly from week to week. Under ideal circumstances, the funded research project contains within it the student's thesis research topic, in which case the actual time spent on the project may be much higher than 20 hours per week. Full-time status for an RA requires taking at least six graduate credits per semester.

Tuition Scholarships are occasionally available. As the name implies, these scholarships contain sufficient funding to pay full-time tuition, but they contain no subsistence funding. The department is allowed to request 10 hours per week of work in return for a tuition scholarship.

External fellowships are in a different category, since they do not come to the student through the University of Delaware. Students have obtained funding from such sources as NASA's Global Change Fellowship program, NASA's Space Grant program, the American Meteorological Society's Fellowship program, the Science, Mathematics and Research for Transformation (SMART) Fellowship program, and the American Association of University Women. Stipends and conditions of these fellowships vary. Obtaining such fellowships is important to the department, so we assist any student applying for them as much as possible. We attempt to find tuition scholarships for externally funded students whose fellowships do not include tuition, and we provide office space for externally funded students.

Time limits. Internal funding awards are made at most one academic year at a time. The department almost universally provides a second year of funding to students admitted with funding, so long as adequate progress has been made during the first year. Departmental funding beyond two years for a master's student or three years for a Ph.D. student is considered exceptional and will be made only if justified by circumstances and allowed by financial conditions.

Funding period. The university considers students who receive internal fellowships or assistantships fully funded for the nine-month academic year. As a condition of receiving these fellowships and assistantships, they agree not to work more than 20 hours per week during the academic year without permission, which effectively eliminates additional outside employment. This restriction exists because the primary goal of these fellowships and assistantships is to help a

student obtain a graduate degree. Hence, we wish to maintain a sufficient amount of time for personal coursework and research. The department does not assign TA obligations during winter session, *but funded students are expected to be in residence and working on research during these periods*. RAs vary with the project, but often expectations continue through winter session.

Summer funding is not automatically included in any of the standard funding packages. When possible, the department may offer summer funding to first-year graduate students, but these have additional application requirements and are considered a form of RA. Many RA packages and some external fellowships provide additional funding to cover some or all of the summer months.

Advanced students who have TA experience in our introductory courses, and who have approval of the course's primary instructor, may be allowed to teach courses as primary instructor during winter and summer sessions. Besides providing an additional funding source, such teaching is an invaluable experience for students considering an academic career, however, such teaching opportunities should be considered in the context of a student's primary objective to complete their degree program in a timely fashion.

Sustaining status. Students who have completed every requirement for a degree except presenting or defending and submitting the thesis may consider registering as sustaining, rather than as full-time students. Students who leave full-time student status while still working on a thesis are required to register as sustaining in every regular semester until they graduate (and in their last summer or winter session, if they are going to graduate at the end of that session). However, students are not allowed to register as sustaining, even if they leave the university and full-time student status, unless all course credits, thesis or dissertation credits, and any other requirements for the degree are fulfilled. Payment of sustaining fees is required for continued use of university resources, including libraries, computer networks and resources, laboratories, and advisers.

Ethics, Rules, Problems

The University of Delaware expects all faculty and graduate students to maintain high ethical standards in all professional activities. The university provides occasional seminars on research ethics, and attendance at one of these during a graduate career is strongly recommended. Research involving human subjects requires approval by a university committee, and these restrictions may come into place with such seemingly minor activities such as surveys and interviews. Restrictions on handling of hazardous materials come into play with antifreeze used in rain gauges, lead-acid batteries, and mercury-contaminated soil samples for example. Students are expected to be in compliance with all such rules, but the university provides training and information, and the department stands ready to provide information and advice. Please start by asking your adviser whenever in doubt.

Complaints of a more difficult nature arise rarely but are taken very seriously, such as disputes regarding a grade, accusations of academic misconduct, concerns about sexual harassment or any other kind of harassment. The university has well-defined procedures in place for dealing with most academic grievances, sexual harassment claims, and other problems. The contact offices maintain a strong web presence on the UD web site so that they can be contacted privately, but students should feel free to contact department staff or the Chair to help find such resources.

One type of dispute that cannot always be resolved by grievance procedures and moderation is an academic dispute in which a student disagrees with a faculty member regarding a fundamental

point about the validity of a scientific result, whether a contribution to a project is worthy of authorship credit, or whether a piece of work constitutes a satisfactory thesis or dissertation. As described above, judgment on such items is placed entirely in the hands of advisers and committees. The university administration will not override a purely academic or scientific judgment of one of the faculty, so a student must be prepared to meet the concerns and standards of the committee. In extreme cases, late changes of adviser and committee will be permitted, but in such cases the department will seek to make sure that research ideas from one faculty member are not being unfairly credited to another—a form of intellectual property theft.

Graduate Student Service and Activities

Graduate students engage in variety of activities generally in the category of professional service. None of these activities are required in any formal sense, however, just as the faculty serves on committees, review papers and grant proposals, and undertake responsibilities within national organizations and within the wider public community, so also service is part of the professional development of graduate students.

Student governance. Within the department, graduate students meet regularly to discuss issues of their concern, including issues that may arise by questions to them from the faculty. These meetings are called and led by an elected graduate student representative. The graduate student representative also attends faculty meetings as a non-voting participant (except when personnel issues are being discussed) and serves as a communication conduit between faculty and students. Another representative is elected by the students to represent our department at the university's Graduate Student Association.

Department life. Graduate student volunteers help plan and take care of logistics for our seminar series (snacks, audiovisual setups, cleanup, etc.), and help plan and execute the department's social events, among other things. While seemingly mundane, these activities have a profound effect on the quality of life within the department. Graduate students also provide an important educational service to the department by proctoring exams.

Professional contacts. Some activities within the department are undertaken primarily to provide a wider education, as well as contacts with people from other departments and other campuses. Departmental seminars provide contacts in addition to their educational value. Outside guests for seminars may spend some time in the department on the day of their presentation, and meeting times are usually set aside to provide graduate students with an informal chance to learn from our visitors. Notices for related seminars from other departments are also posted in the department. *It is the expectation of the faculty that students will regularly attend the geography departmental seminar and that such attendance constitutes an integral component of their graduate program.*

The department encourages and subsidizes travel of students for professional activities, such as presentation of papers or posters at conference and outside training courses. (Attending the national meetings of the Association of American Geographers at least once before one is ready to present a paper may also be subsidized—check with the department office for current rules and amounts.) Women students may obtain a small additional travel subsidy from the university's Office of Women's Affairs. These conferences are an excellent opportunity for students to meet the people whose papers they read.

Resources

Institutional resources. Climatological research is supported by the Office of the State Climatologist and the Delaware Environmental Observing System (DEOS), both located within the department. Studies in geographic education are enhanced by the Delaware Geographic Alliance, a coordinated effort by the Department, teachers, school administrators, and the Delaware Department of Education. Funded by the National Geographic Society and the State of Delaware, its mission is to help reinforce geography teaching and learning in the K-12 curriculum.

Computational resources. The department strives to provide graduate students with sufficient computing resources for all their course work, thesis research, information gathering, writing, and preparation of graphics, presentations, and thesis drafts. All students entering the University of Delaware immediately receive access to central Unix systems for general purpose computing, email accounts, and access to the internet via udel.edu gateways. The college offers resources to develop personal web site, and the department sponsors additional resources to allow graduate students to do research and maintain course files on departmental and central Unix systems.

The best equipment owned by the department will typically be in the shared space, Pearson 203, which serves as a university-wide GIS teaching and research lab. All of the equipment in Pearson 203 is available whenever classes are not in session in that room.

Limitations on our budget and common courtesy require that students be reasonably conservative in the use of the more expensive resources, such as color printing, and that preference is given to students with pressing research and coursework problems at times when most of the seats in 203 are full.

The department's Geographic Systems Analyst, Kenji Matsuura, administers computers owned by the department. Requests for resources on the department's servers, reports of problems with machines in Room 203, and inquiries about what resources we have and where they are located should be directed to him. Requests for resources and questions about access on the central systems should be directed to Brian Hanson, who serves as the liaison to the university's Information Technology division for these requests. Requests for additional software installations on our departmental machines should be directed to Tracy DeLiberty and Michael O'Neal, who evaluate our licensing costs and needs. The department is strict about maintaining only properly licensed software on the machines it controls.