GRADUATE GUIDELINES
MASTER OF SCIENCE IN GEOGRAPHIC AND CARTOGRAPHIC SCIENCES (MS-GECA)
DEPARTMENT OF GEOGRAPHY AND GEOINFORMATION SCIENCE
GEORGE MASON UNIVERSITY

These guidelines are designed to provide guidance to graduate students in the Master of Science in Geographic and Cartographic Sciences (MS-GECA) degree program. It is a supplement to the catalogs of the university. The Mason catalogs are the official guidelines for all students.

The focus of this program is to prepare students for careers in geography, remote sensing, and GIS and its increasing applications in diverse fields, as well as cartography, visualization, and modeling. This expertise is useful to civil and defense federal agencies, state and local government agencies, private corporations, and educational institutions. Courses concentrate on the techniques of compilation, display, and analysis of spatial data, and associated applications. Hundreds of our alumni from this program have entered employment in the Washington, D.C. area and around the country and the world since 1978.

Admissions Requirements
In addition to meeting all admission requirements for graduate study at Mason, applicants must have a bachelor's degree, and must have at least one course in each of the following areas:

- Physical Geography
- Human Geography
- Cartography or GIS
- Statistics

Most applicants who have a bachelor's degree in geography, cartography, or a related discipline will already have taken these courses, and can document the completion of these requirements through the submission of transcripts during the admission process. However, applicants from other backgrounds are welcome, but they may be admitted provisionally, until these requirements are met.

Admission to the MS-GECA program also requires transcripts of all college course work, GRE aptitude scores, three letters of recommendation, and a statement of interest in the program.

The Registrar at GMU has established application deadlines for this program:

- Fall semester – April 15th
- Spring semester – November 1st

Provisional Admittance
If students have not taken courses in the required areas specified above, or otherwise have deficiencies in their application, they may be admitted provisionally, with the provisions specified by the Admissions Committee and approved by the Graduate Coordinator of the department. The decision to admit provisionally and the conditions of the provisional admission are entirely at the discretion of the Admissions Committee and the Graduate Coordinator. Commonly, provisional requirements will be to take make-up courses (either graduate or undergraduate). Minimum grade provisions may be required. Provisionally admitted students for subject area deficiencies MUST inform the Graduate Coordinator when they have resolved the deficiencies in order to have the Provisional status removed. No transfers of graduate credit will be approved until Provisional status is removed, and graduation cannot occur until Provisional status is removed.

College Transcripts
During the application process you will be asked to submit official transcripts for all college work completed. This includes any courses taken at the college level that did not result in a degree.
GRE Scores
GRE scores are required for admission to the program. Although there are no hard GRE score cutoffs for admission, and the entirety of a student’s application will be considered, GRE scores are an important indicator of potential success in graduate school. Therefore, students considering applying to the MS-GECA program are encouraged to study aggressively for the GRE prior to taking it. While the GRE exam should be taken seriously by all applicants to the program, it should not be allowed to become an impediment to applying to the program.

The only exception regarding the need to submit GRE scores is that applicants who already hold a graduate degree from an accredited, domestic institution do not need to retake the exam. Submit your previous scores if you still have them. Your transcripts will document your graduate degree. If this exception pertains to you, please note it on your application.

Letters of Recommendation
Letters of Recommendation should be written by professional or academic referees. These letters should focus on aspects of the applicant’s experience that would highlight their ability to successfully perform in a graduate academic environment. Experience related to the degree is of particular interest.

The applicant is responsible for obtaining the recommendations using the “Recommendation for Graduate Study” form available on the Graduate Admissions Website:
http://www.admissions.gmu.edu/documents/graduateRecommendationForm.pdf
The form must be completed by the recommender, signed and sealed in an envelope, and signed across the seal. An additional letter may be included in the envelope at the recommender’s discretion. The sealed envelope is returned to the applicant for submission to the Graduate Admissions Office.

Statement of Interest
While there is substantial latitude regarding the statement of interest, applicants are encouraged to focus on their interest in academic geography and geoinformation science, and the ways in which their interests coincide with the interests of faculty members in the department. Descriptions of prior experience and discussions of the applicant’s intentions following successful completion of the degree are also appropriate. Applicants should avoid purple prose.

Deferment of Admissions
If a student is admitted into the program and wishes to defer enrollment, the student should contact the COS Admissions Office (mhayes5@gmu.edu) to request a deferment. If a deferment is not requested and granted, the student’s enrollment status will become “NS” which indicates “No Show” or “Inactive”.

Degree Requirements
Required Core Courses
Students MUST complete the following four required core courses:
- GGS 553 Geographic Information Systems
- GGS 579 Remote Sensing
- GGS 560 Quantitative Methods
- GGS 689 Seminar in Thought and Methodology

Students are strongly encouraged to take these courses as early as possible during their graduate program to prepare for other classes and to avoid delaying graduation while waiting for a required course. Transfer courses from other institutions and waivers will NOT generally be accepted for these required core courses. More specifically, waivers will NOT be granted based on undergraduate work of any kind. Waivers will NOT be granted based on work experience. Waivers will NOT be granted for any short-courses, workshops, or training sessions. Waivers will NOT be granted for any combination of the above. Please refer to the graduate catalog for course prerequisites.

Elective Courses
In addition to the four required core courses, students MUST complete a series of elective courses to meet the requirements of the degree. The number of elective credits required is a function of the student’s choice to pursue the
Thesis Option or the Comprehensive Exam Option.

- **Thesis Option:**
  - Complete a minimum of 18 credits of acceptable elective coursework
  - Of the 18 credits of electives 3-6 hours MUST be in GGS 799 (Thesis Writing)

- **Comprehensive Exam Option:**
  - Complete a minimum of 24 credits of acceptable elective coursework

Please recognize that these are the minimum required credits for graduation. The student may decide to take additional courses to better complete their education. Since course offerings are outside of the control of the coordinator of the MS-GECA program, no guarantees can be given regarding the availability of any courses for any given semester.

Elective courses must be approved by your advisor. Commonly accepted elective courses include:

- GGS 503 Problems in Environmental Management
- GGS 505 Transportation Geography
- GGS 525 Economics of Human/Environment Interactions
- GGS 531 Land-Use Modeling Techniques and Applications
- GGS 533 Issues in Regional Geography
- GGS 540 Medical Geography
- GGS 551 Thematic Cartography
- GGS 554 History of Cartography
- GGS 562 Photogrammetry
- GGS 563 Advanced Geographic Information Systems
- GGS 580 Digital Remote Sensing
- GGS 581 World Food and Population
- GGS 590 Geography of Insurgency
- GGS 590 Political Geography
- GGS 590 GIS for Business
- GGS 590 GIS for the Environment
- GGS 605 Socioeconomic Applications of GIS
- GGS 631 Spatial Agent-Based Models of Human–Environment Interactions
- GGS 650 Introduction to GIS Programming
- GGS 653 Geographic Information Analysis
- GGS 655 Map Design
- GGS 656 The Hydrosphere
- GGS 658 Terrain Mapping
- GGS 661 Map Projections and Coordinate Systems
- GGS 664 Spatial Data Structures

All elective courses must be approved in writing (email is fine) by the student’s advisor prior to starting the course. It is preferred that all elective courses be GGS courses, however exceptions may be made in cases where a particular course from a closely related discipline is pertinent to the student’s studies or research. In no case will more than 9 credits from other departments be applied to the degree. Any course outside of GGS will require the completion of a Substitution/Waiver Form, and it is the responsibility of the student to complete the form and submit it to the GGS office for approval and signatures.

**Thesis Option and Comprehensive Exam Option Requirements**

*Choosing an option*

Students are not required to declare their choice of the thesis option or comprehensive exam option until they wish to begin the graduation process. The choice should be made in consultation with the student’s advisor, although the Thesis option is frequently preferred.
**Thesis Option**


Establishing a Thesis Committee
As soon as a student chooses the thesis option, he/she should form a committee. Per university requirements, the master’s thesis committee is composed of at least three members of the graduate faculty, at least two of whom must be from the Department of Geography and Geoinformation Science. The graduate faculty consists of all George Mason University tenured and tenure-track faculty. Other Mason faculty members, as well as individuals from outside the university, may be appointed to the graduate faculty by the Provost for a specified duration of time. The student can request a faculty member other than his/her original advisor to chair the thesis. One of the GGS faculty members on the committee must act as the committee chair. At the discretion of the committee chair, additional committee members may be added if they bring additional expertise to the thesis review process, but they must be approved as members of the graduate faculty. The committee must be approved by the Departmental Chair and the College of Science. The student must complete the MS-GECA Thesis Committee Designation Form (available on the MS-GECA website) and obtain all of the necessary signatures.

Preparing and Defending the Thesis Proposal
The student should immediately engage the committee in a discussion of the content of the thesis, and the research program to be pursued. Based on these consultations with the committee members, the student should prepare a thesis proposal. An acceptable proposal must include a clear statement of the research objective, an initial literature review, a discussion of the methods to be employed, a description (usually including maps and graphics) of the data to be employed, and a discussion of the expected outcomes of the research. The student should submit the proposal as early as possible to the committee for comments, and expect to be asked to make changes to the proposal. When the chair determines that the proposal is sufficient, s/he will schedule a defense of the proposal. This defense may consist of an oral presentation or some other format for the exchange of ideas among the committee and the student based on the proposal that has been submitted. The format of the defense is at the discretion of the committee chair. The student must complete the MS-GECA Thesis Proposal Defense Form (provided at the end of this document and available on the MS-GECA website), obtain all of the necessary signatures, and include a copy of the proposal. A student may not enroll in GGS 799 (Master's Thesis) until the proposal is approved by the committee and the appropriate materials submitted to the office of the Dean.

Writing the Thesis
After the proposal has been accepted and submitted to the Dean, the student may enroll in thesis research (GGS 799) at the beginning of the next semester. Students should obtain a copy of the “Individualized Section Form” (http://registrar.gmu.edu/wp-content/uploads/IS.pdf) and fill out their information. The instructor for that class will be the thesis committee chair. The University requires that students must register for a minimum of three credit hours in their first semester of 799. After that semester, students may enroll for one credit of 799 per semester and be considered full time, if the following requirement is met: the student, advisor and department chair must certify each semester that the student is working full time on the thesis. A maximum of 6 credits of GGS 799 may apply to the degree. Please note: Master's students must maintain continuous enrollment in 799 while writing and submitting a thesis. Students registered in 799 are graded IP until work is complete; at that time they are graded S/NC, and previous IP grades are updated by the Office of the University Registrar to reflect the final S or NC grade. The content of the thesis is the responsibility of the student, who should rely on frequent input and direction from the committee chair and other members to ensure that it is acceptable. The student is responsible for keeping all committee members informed of the scope, plan, and progress of both the research and the thesis. The thesis must conform to the format and guidelines specified by University Dissertation and Thesis Services. The thesis will not be accepted by the library, and graduation will be delayed if these guidelines are not closely followed. Please consult these guidelines (http://thesis.gmu.edu/) early in the process (ideally beginning with the proposal) and frequently throughout the thesis research to ensure an acceptably formatted thesis document. The thesis may only be submitted after the formal defense, but should be checked by the library Thesis Coordinator prior to the defense.

Defending and Submitting the Thesis
When the thesis is finished, the student must give a public presentation to defend the thesis. The thesis committee chair is responsible for administering the thesis defense, including approving the defense, announcing the defense,
conducting the defense, and reporting the results of the defense. A defense should be advertised within the department and the College of Science at least one week prior to the defense date (via email and/or posted flyers). Requests for departmental announcements can be addressed to Teri Fede (tfede@gmu.edu) and requests for College of Science announcements can be addressed to cosdefen@gmu.edu.

The student should give a presentation of the research and results and expect to take questions from the public and the thesis committee. After the public presentation the committee may, at their discretion, conduct a private examination with further questions. The committee will discuss and vote in private and inform the student of the result of the thesis defense. Successfully defended theses must meet the thesis requirements of the university. The student is responsible for knowing the university’s deadline for thesis submission (http://thesis.gmu.edu/) for the selected graduation term. The deadline is generally no later than 5pm on the Friday prior to the last day of classes for the term. The student and the thesis committee chair should take care that the defense is held early enough to ensure that any requested changes in the thesis can be made, and any formatting issues corrected, prior to the university thesis submission deadline. The original and one copy of the master's thesis with two original signed cover sheets must be deposited with the college/school/institute dean or director for dean/director's signature prior to being transferred to the University Libraries. For degree conferral, two copies with cover sheets signed by committee and dean/director of college/school/institute must be submitted to the library. Please submit a copy of the thesis to the department for retention in our library.

Comprehensive Exam Option

If the advisor deems it appropriate a student may choose to take additional courses and complete a comprehensive examination. The examination will be administered by a two-person Departmental full time faculty committee. The exam is typically taken near the middle of the semester, but in any case must be completed with sufficient time to make changes (if required) and still meet the deadlines of the university for the semester in which the student expects to graduate. If you plan to graduate in the same semester in which you are taking the Comprehensive Exam you must complete the Comprehensive Examination Recording Form (see link below) prior to the mid-point of the semester in which you will graduate (March 1st for Spring Semester, October 15th for Fall Semester).

The purpose of the comprehensive examination is NOT to simply re-hash information or skills learned in class, but rather is to allow the student an opportunity to demonstrate that he or she has Mastered the pertinent subjects in the discipline of Geography and Geoinformation Science. This will require the student to be able to show their breadth of knowledge across the discipline, and the depth of their knowledge in more specific areas of interest. Students should expect to use all of the skills they learned during their time in the program, including the use of GIS, good cartographic practice, problem solving skills, and academic writing including the citation of peer reviewed academic journals.

The student must provide a written statement indicating his or her academic areas of specialty. The content of the exam will be based in part on this statement. The student should schedule at least two meetings with the committee members (all together, individually, or some of both) well in advance of the exam date in order to obtain suggested readings for preparation for the exam, and to discuss the content with the committee. If the committee chair does not feel that the student is sufficiently prepared to take the exam he or she may require that the exam be postponed to the following semester.

Prior to the exam, the student should complete the following steps:
1) Prepare the written statement of interests and areas of specialty.
2) Download, print, and complete the first part of the Comprehensive Examination Recording Form http://ggs.gmu.edu/Forms/Comprehensive_Examination_RECORDING_Form_Edited.docx
3) Approach the two members that the student would like to serve as examiners.
   a. Ask them if they are willing to serve (if not, approach other potential members)
   b. Present the committee members with the statement of interest
   c. Decide together on a scheduled date for the examination
   d. Have everyone sign the Comprehensive Examination Recording Form
4) Forward the Comprehensive Examination Recording Form to the MS-GECA Coordinator
5) Prepare for the examination at the direction of the committee members. Meet as necessary to clarify any and all content or format issues.
While there is some latitude regarding the format of the comprehensive examination (at the discretion of the committee chair and the MS-GECA coordinator) it is common that the exam will be a take-home exam given over three days (a long weekend, for example). There are generally two questions per day; some questions will be required to be answered, while others may involve some choice of what to answer on the part of the student. Each “question” may in fact consist of several related questions on a single topic.

There are 4 possible outcomes from the committee evaluation of the completed exam:

1) Failure – This indicates that the student has not demonstrated a comprehensive mastery of the material. The degree will not be awarded.

2) Retake – This indicates that the student has not demonstrated a comprehensive mastery of the material, but the work presented does indicate that such mastery could be demonstrated through an additional exam.

3) Conditional Pass – This indicates that the student must make changes or additions to their answers in order to demonstrate comprehensive mastery of the material. The committee will not pass the student, nor will the degree be awarded until the changes have satisfactorily been made. These changes may be minor or major at the discretion of the examining committee. Given that students are being asked to demonstrate mastery of an entire discipline in 3 days, the Conditional Pass result is to be expected and is the most common outcome of the exam.

4) Pass – This indicates that the student has demonstrated a comprehensive mastery of the material and has successfully completed the examination.

The committee may - and will frequently - request an oral presentation of the exam questions and answers to the academic community.

University Requirements
In addition to the requirements specific to the MS-GECA Degree above, there are degree requirements imposed by George Mason University. You should check the University Catalog for details, but in summary those requirements are:

- Candidates must earn a minimum of 30 graduate credits.
- Only graduate courses may apply toward the degree.
- The majority of the credits applied to the degree must be earned at Mason.
- A minimum of 18 credits must be taken in degree status, after admission to the degree program.
- A maximum of 6 credits of master’s thesis research (799) may be applied to the degree.
- Candidates must have a minimum GPA of 3.00 in course work presented on the degree application
- The GPA courses may include no more than 6 credits of C

Advising
Students are assigned an initial advisor during the admission process. This advisor or the Graduate Coordinator can provide orientation to the program including course selection, the thesis or non-thesis options, faculty interests and other academic matters. Each student may request a change in advisor to better reflect his or her specific interests. The initial advisor and the GECA - MS Coordinator may assist in that determination. A final advisor must be selected for the thesis or comprehensive examination option.

Transfer courses
Students may have taken graduate courses in other institutions prior to their admission to Mason. Credits earned from another institution cannot be applied to the MS-GECA program automatically. Subject to University guidelines, the department will evaluate individual cases. If a student wants to apply those courses to the GECA program, they must submit a completed Mason Graduate Transfer of Credit Request form (http://registrar.gmu.edu/wp-content/uploads/GTC.pdf) and supporting documents (such as a transcript, syllabi, assignments, projects, etc.) to their advisor demonstrating that they have already acquired the skills and knowledge that would otherwise be provided by particular courses in the MS-GECA program. This form requires the approval of the GGS Graduate Coordinator and the Dean of the College of Science. They will determine whether the credit is eligible for transfer and applicable to the MS-GECA degree program. Mason has a policy of transferring a limited number of credits into a MS program from other universities. In general, training courses taken from Federal agencies or the private sector are not acceptable for transfer.
Important: Credit transfer requests from students who are admitted provisionally are not considered until they have fulfilled the conditions of their admission and had the provisional qualifier removed from their records.

To be eligible for transfer credit, the credit must be graduate credit earned at another accredited university, and recommended for graduate credit in the American Council on Education guidebook. The credit must have been earned within six years prior to first enrollment as an admitted student in the MS-GECA degree program, and a minimum grade of B (3.00) must have been earned.

The number of credits that may be transferred is a function of the number of class credits required for the degree based on the choice of the thesis or exam option (as outlined above) and the requirement that 18 credits be taken in degree status at Mason. More specifically, if a student is pursuing the Thesis option, they must take the four required core courses for a total of 12 credits (no transfers are accepted for these courses). They must take 18 credits of elective courses, but at least six of these must be taken at Mason to meet the requirement that 18 credits are taken in residence. Therefore, only up to 12 credits of elective courses could be transferred, if they are approved by the department. If a student were pursuing the comprehensive exam option, 24 credits of elective courses are needed, thus up to 18 credits could be transferred if they were approved through the process outlined above.

With prior departmental approval, students may be permitted to apply up to nine hours of course work from closely related disciplines at Mason to the degree.

Taking classes prior to Admission to the Program
Although students should apply directly to the GECA – MS program as early as possible, there is a mechanism for taking courses prior to formal admission to the degree program. Please see the guidelines at http://admissions.gmu.edu/nondegree/ for details on non-degree admission.

Students who take graduate courses at Mason under extended studies or non-degree status prior to formal admission to the MS-GECA program must transfer those courses using a Graduate Transfer of Credit Request form. This includes any Geography courses. Courses may not be transferred during Provisional Status.

Transferring from the Graduate Certificate in Geographic Information Science at Mason
While this is not always the case, generally speaking courses taken (and successfully completed) for the Graduate Certificate in Geographic Information Science will automatically be applied to the MS-GECA. No Graduate Transfer of Credit form is necessary in this case. Courses transferred from the Certificate Program do not decrease the required 18 hours in residency for the MS program. The University does not allow courses to be used toward two or more Master’s or PhD degrees.

Internships
The Department usually does not initiate internship arrangements. If a student feels that an internship will be beneficial to his/her program, the student should search for potential sponsor(s). After the student and the potential sponsor identify the tasks and the scope for the internship, either the student or the sponsor should document the nature, scope, specific tasks, and the duration of the internship. This document should be submitted to the student’s advisor or other faculty member. If the proposed internship is acceptable, the student should enroll in GGS 695 with the sponsoring faculty member.

Internships should be opportunities for students to gain knowledge or experience that cannot be acquired through courses. In general, three credit hours of internship requires 150 hours of work with the sponsor. Ideally, the nature and scope of an internship should be integrated with the department's curriculum and the student’s specific academic interests. It is expected that the sponsors will be able to supervise students on the described tasks. At the end of the internship period, the sponsor and faculty member will communicate to render a grade to the student.

The department occasionally receives internship requests from private and public organizations and posts that information. A collection of such requests in also kept in a departmental binder. Internship credit is normally not provided for a student’s current employment.

Financial Support
In each academic year, the department receives a limited amount of money from the College as Graduate Teaching
Assistantships (GTAs). Students who want to be considered for a GTA position should have filled out the section for GRA/GTA consideration in the application packet and inform the Departmental Graduate Coordinator or their interest each academic year. Each assistantship award usually lasts for one academic year. When the department awards a GTA to a student, it is not obliged to provide financial support to that student in subsequent year(s) but normally every effort is made to continue the support for four semesters.

Individual faculty members and/or the Department may receive research funding from the University or outside sources to hire Graduate Research Assistants (GRAs). If students are interested in this kind of financial support, they should contact individual faculty members directly and inform their advisor and the Graduate Coordinator of their interest.

Time Limits and Enrollment Status
MS-GECA students must complete their degree within 6 years from the time of first enrollment as a degree-seeking student. Once enrolled in the program students can skip a maximum of one semester without registering and maintain their active status. Permission to re-enroll in a program must be obtained by all masters degree students who have failed to enroll in at least 1 credit of course work for two or more consecutive semesters at Mason. If a student is Inactive and in good standing, the student may apply for re-enrollment using the form found at http://registrar.gmu.edu/wp-content/uploads/GRE.pdf. If a student is inactive and is NOT in good standing (facing termination or dismissal) the student must appeal the termination or dismissal and complete a re-enrollment form. Appeal requires approval of Department, Graduate Dean and Vice Provost. If the student is Inactive and over or near the timeline period, the student must complete a timeline extension request form (available at http://registrar.gmu.edu/wp-content/uploads/MRTLE.pdf and requires signature from student, department, dean and vice provost) and a re-enrollment form. If either permission to re-enroll or permission for a timeline extension is denied the student must reapply to the program and is not guaranteed acceptance or admission.

Full-time Classification of Graduate Students
Graduate students are considered full-time if they are enrolled in at least nine credits per semester or if they hold a full time assistantship (20 hours a week) and are enrolled in at least six credits per semester. Please note: Different criteria for full-time status may apply for tuition, verification, and financial aid purposes. Contact Student Accounts, the Registrar's Office and Student Financial Aid, respectively, for questions regarding student-specific status.

Graduation
The Registrar’s office has an extensive web site regarding deadlines and procedures for graduation (http://registrar.gmu.edu/students/graduation). Please refer to this site in the semester prior to the semester in which you intend to graduate. The filing deadline for the Intent to Graduate is in the semester PRIOR to the semester in which you intend to complete all of your requirements. If you submit an “Intent to Graduate”, then discover that you will not complete your requirements in time, you should file a “Withdraw Intent to Graduate” request. The form is available on the Registrar’s website given above. If you do not graduate in the semester for which you submitted an “Intent to Graduate” you must submit a new “Intent” for the new graduation date.