Program Change Request

Date Submitted: 02/01/26 10:00 pm

Viewing: SC-PHD-ESGS : Earth Systems and Geoinformation Sciences, PhD

Last approved: 03/28/25 4:20 pm

Last edit: 02/01/26 10:00 pm

Changes proposed by: nburtch

Catalog Pages Using this Program

Earth Systems and Geoinformation Sciences, PhD

Are you completing this form on someone else's behalf?

No

Effective Catalog: 2026-2027

Program Level: Graduate

Program Type: Doctoral

Degree Type: Doctor of Philosophy

Title:

Earth Systems and Geoinformation Sciences, PhD

In Workflow

1. **GGS Chair**
2. **SC Curriculum Committee**
3. SC Assistant Dean
4. Assoc Provost-Graduate
5. Registrar-Programs

Approval Path

1. 02/05/26 10:50 am Nathan Burtch (nburtch): Approved for GGS Chair

History

1. Nov 9, 2017 by clmig-jwehrheim
2. Feb 15, 2018 by rzachari
3. Mar 7, 2019 by Jennifer Bazaz Gettys (jbazaz)
4. Mar 15, 2019 by Tory Sarro (vsarro)
5. Feb 23, 2021 by jriemen
6. Apr 29, 2022 by Tory Sarro (vsarro)
7. May 12, 2022 by Tory Sarro (vsarro)
8. Apr 24, 2023 by Nathan Burtch (nburtch)

9. Apr 28, 2023 by Tory Sarro (vsarro)
10. Apr 26, 2024 by Nathan Burtch (nburtch)
11. Mar 28, 2025 by Nathan Burtch (nburtch)

Banner Title: Earth Systems & Geoinformation

Is this a retitling of

Registrar/OAPI Use Only – SCHEV Status Approved

Registrar's Office Use Only – Program Start Term

Registrar/OAPI Use Only – SCHEV Letter

Registrar/OAPI Use Only – SACSCOC Status

Concentration(s):

Registrar/IRR Use Only – Concentration CIP Code

College/School: College of Science

Department / Academic Unit: Geography & Geoinformation Science

Jointly Owned Program? No

Is there an embedded degree as part of a program?

Justification

What: Adding GGS 621, removing GGS 777

Why: We have created the new Remote Sensing Natural Hazards course, and deactivating the 700-level one.

Total Credits Required: Total credits: 72

Registrar's Office Use Only - Program Code:

SC-PHD-ESGS

Registrar/IRR Use Only – Program CIP Code

Admission Requirements:

Admissions

University-wide admissions policies can be found in the Graduate Admissions Policies section of this catalog. International students and students having earned international degrees should also refer to Admission of International Students for additional requirements.

Eligibility

This program is intended for graduates who hold a MS or MA degree from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent in atmospheric science, climatology, meteorology, Earth science, geology, environmental science, remote sensing, hydrology, oceanography, geography, or a related field.
Highly-qualified students with a BS or BA from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent in applicable fields are also encouraged to apply.
Knowledge of mathematics through calculus is preferred.
Interested applicants should contact the GGS graduate coordinator for more specific advice if needed.

Application Requirements

To apply, prospective students should submit the George Mason University Admissions Application and its supplemental documentation, three letters of recommendation, and a goals statement.
GRE scores are not required for admission into this program, but are strongly encouraged if a student is seeking internal funding support.

Program-Specific Policies:

Policies

For policies governing all graduate programs, see AP.6 Graduate Policies.

Transferring Previous Graduate Credit into this Program

Previously earned and relevant graduate credits may be eligible for transfer into this program; details can be found in the Credit by Exam or Transfer section of this catalog.

Secondary Program Options

Students enrolled in this doctoral program have the option of adding a secondary graduate certificate or master's program. Depending upon the secondary program chosen, many courses may be applicable to both programs. Before adding a secondary program, students are advised to carefully review AP.6.8 Requirements for Graduate Certificates or AP.6.9 Requirements for Master's Degrees and AP.6.10 Requirements for Doctoral Degrees. Faculty advisors should be contacted for further guidance and for secondary program suggestions.

Degree Requirements: Students should refer to the Admissions & Policies tab for specific policies related to this program.

Core Courses

Students are required to choose from the following courses in the core areas below. Of the cores, students must complete at least one course in five of the cores and two courses in at least three of those five cores.

The core areas from which to choose these credits are:		24
Quantitative Core:		
GGS 560	Quantitative Methods	
GGS 754	Earth Science Data and Advanced Data Analysis	
GGS 791	Advanced Spatial Statistics	
Geoinformatics Core:		
GGS 632	Spatial Modeling for Public Health	
GGS 650	Introduction to GIS Algorithms and Programming	
GGS 664	Spatial Data Structures	
GGS 675	Location Science	
GGS 692	Web-based Geographic Information Systems	
GGS 787	Scientific Data Mining for Geoinformatics	
Geosciences and Physical Geography Core:		
GGS 656	The Hydrosphere	
GGS 657	The Lithosphere	
GGS 670	Introduction to Atmosphere and Weather	
PHYS 575	Atmospheric Physics	
Human Geography Core:		
GGS 504	Population Geography	
GGS 505	Transportation Geography	
GGS 507	Geographic Approaches for Sustainable Development	
GGS 515	Economic Geography	
GGS 516	Geography of Latin America	
GGS 517	Modern China: A Geographical Appraisal of its Land, People, Culture, and Politics	

GGS 518	Geography of North Africa and the Middle East	
GGS 526	Geography of Eastern Europe and Russia	
GGS 533	Issues in Regional Geography	
GGS 540	Health Geography	
GGS 557	Urban Planning	
Geographic Information Science Core:		
GGS 551	Cartographic Design	
GGS 553	Geographic Information Systems	
GGS 563	Advanced Geographic Information Systems	
GGS 655	Geovisualization	
Remote Sensing Core:		
GGS 579	Remote Sensing	
GGS 621	Remote Sensing of Natural Hazards	
GGS 622	Drone Remote Sensing	
GGS 626	Physical Fundamentals of Remote Sensing	
GGS 629	Remote Sensing of the Environment and Earth System	
GGS 680	Earth Image Processing	
GGS 760	Advanced Topics in Remote Sensing	
~~GGS 777~~	~~Remote Sensing Natural Hazards~~	
Total Credits		24

Research Synthesis and Colloquium

Research Synthesis		**3**
GGS 689	Seminar in Geographic Thought and Methodology	
Colloquium		**2**
GGS 900	Geography and Geoinformation Science Colloquium (complete twice)	
Total Credits		5

Electives

In consultation with the advisor, students select credits necessary to reach 72 total credits [1]	19-31

[1] At least half of the elective credits taken at Mason must be from GGS courses.

Dissertation Research

Students take 12-24 credits, with at least 6 credits in GGS 999 Dissertation. After reaching candidacy, students must stay continuously enrolled GGS 999 Dissertation until defending their dissertation.

Select 12-24 credits from the following:		12-24
GGS 998	Dissertation Proposal	
GGS 999	Dissertation	
Total Credits		12-24

Dissertation Committee

All students will be assigned a temporary academic advisor when they first enroll in the program. No later than the end of the second year, each student should identify a dissertation advisor and form a doctoral committee. The committee will be chaired by a GGS tenure or tenure-track professor and be composed of at least four members. GGS tenure or tenure-track faculty should be at least 50% and have larger committee membership than any other Mason department/academic unit or external organization. At least one member should be a tenure or tenure-track faculty member from another Mason department or program outside of GGS. All members of the committee must be Mason Graduate Faculty and approved by the department's chair.

Candidacy Examination

After completing all required courses, each student must take a candidacy exam administered by the dissertation committee. The exam will have written and oral components. Its purpose is to determine whether the student has acquired adequate general knowledge in the selected subject area, as well as much more detailed knowledge of the specific research topic planned for the dissertation.

Dissertation Proposal and Advancement to Candidacy

After students have completed all required courses and passed the candidacy exam, they should prepare an acceptable dissertation proposal. After the dissertation proposal is approved and the appropriate paperwork is completed, the student will be advanced to candidacy.

Doctoral Dissertation

The degree will be awarded upon completion of the required coursework and successful defense of a PhD dissertation that makes an original and significant contribution to the field.

Retroactive Requirements

Updates:

Plan of Study:

Honors Information:

Accelerated Description/Dual Degree Description:

INTO-Mason Requirements:

College Requirements & Policies:

Department / Academic Unit Requirements & Policies:

Program Outcomes

Additional Program Information

This information is required by the Office of Accreditation and Program Integrity.

Courses offered via distance (if applicable):

Indicate whether

What is the primary delivery format for the program? Both Face-to-Face and Distance

Does any portion of this program occur off-campus?

No

Are you working with a vendor / other collaborators to offer your program?

No

Related Departments

Could this program prepare students for any type of professional licensure, in Virginia or elsewhere?

No

Are you adding or removing a licensure component?

No

Additional SCHEV & SACSCOC Information

Is this change a simple retitling of an existing program, with no other changes, to any existing program content, curriculum requirements, etc?

No

Does this change represent a repackaging of content in an existing approved degree/certificate program at the same instructional level (i.e., baccalaureate, master's, or doctoral)?

No

Percentage of total credits containing new course content. ("New course content" is defined by SACSCOC as content that is not currently included in an existing approved degree/certificate program at the same instructional level. Do not exclude gen ed credits in calculations for undergraduate programs.)

0%-24%

Does this change include the addition of a distance education or face-to-face method of delivery for this program?

No

Does this change include the addition of a course/credit-based competency-based education delivery option?

No

Will any additional equipment/facilities be needed?

No

Will any additional faculty be required?

No

Will any additional financial resources be needed?

No

Additional library/learning resources needed?

No

Have you reached out to the Libraries to determine whether there are adequate resources to support your program? If not, please email Meg Meiman, Associate University Librarian for Learning, Research, and Engagement at mmeiman2@gmu.edu.

OAPI Use Only – Determination of SACSCOC Impact

Comments or Notes

Green Leaf Program Designation

Is this a Green Leaf program? No

List sustainability-

List sustainability-

Does this program cover material which crosses into another department?

No

Additional Attachments

SCHEV Proposal

Executive Summary

Reviewer Comments

Additional Comments

Is this course required of all students in this degree program?

%wi_required.eschtml%

Key: 214