Program Change Request

Date Submitted: 03/14/23 10:47 am

Viewing: SC-BS-GEOG : Geography, BS

Last approved: 05/20/22 12:57 pm

Last edit: 03/24/23 1:28 pm

Changes proposed by: jbazaz

Catalog Pages Using this Program

Geography, BS

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

Yes

Requestor:

In Workflow

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

Approval Path

1. 03/21/23 12:11 pm Nathan Burtch (nburtch): Approved for GGS Chair

History

1. Nov 1, 2017 by clmig-jwehrheim
2. Jan 11, 2018 by rzachari
3. Feb 26, 2018 by Jennifer Bazaz Gettys (jbazaz)
4. Mar 8, 2018 by rzachari
5. Feb 3, 2019 by Dieter Pfoser (dpfoser)
6. Feb 10, 2020 by Nathan Burtch (nburtch)
7. Feb 9, 2022 by Timothy Leslie (tleslie)
8. May 20, 2022 by Jennifer Bazaz

Gettys (jbazaz)

Name	Extension	Email
Nathan Burtch	1207	nburtch

Effective Catalog: 2023-2024

Program Level: Undergraduate

Program Type: Bachelor's

Degree Type: Bachelor of Science

Title: Geography, BS

Banner Title: Geography, BS

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

Justification

What: Adding GGS 485 (proposed capstone course).

Why: Currently GGS has two 300-level courses for the Synthesis Mason Core. These courses will not be eligible for the new Apex (capstone) Mason Core designation. The intention is to apply GGS 485 towards the Mason Core Capstone or Apex after creation. With this course, with it's project-based approach and utilization of real-world data/scenarios, GGS wants to include the

course as a required major core course.

What: Creation of concentrations for the BS.
Why: There are times when our faculty need to answer the question of "what do you do with a Geography degree?". As opposed to some other disciplines, there is less connection between major and direct occupation. There are plenty of working Geographers out there, but that job title is less concrete in some people's minds. Our intention in creating BS concentrations is to more directly connect degree to (potential) occupations, along with developing more specific curriculum options for students to deepen knowledge in these particular areas.

The Geoinformatics Concentration is essentially a reformulation of our current degree. The current BS is structured so that students choose four of our technical electives that build more depth in the student's choice of GIS, remote sensing, geovisualization/mapping, and spatial computing. The Geoinformatics Concentration takes this structure, then adds additional courses outside of GGS that students can take to build more quantitative and computing skills to couple with skills in geoinformation technologies.

The Urban Science Concentration is roughly aligned with the department's current Urban Informatics minor, and taking that structure to apply to the major. This is creating a more computational concentration with a topical focus in urban areas. Our department currently has multiple faculty members with urban planning or urban science/analysis backgrounds and this concentration will be supported with more courses in this direction. GGS is currently entering the APR 7-year review, and have reports by the labor market analytics firm Lightcast. While not a planning concentration (see our BA proposal for that), Urban and Regional Planners is listed as one of the top 10 target occupations for Geography majors. There is expected 3.31% growth from 2022 to 2027. In another report specifically for Urban and Regional Planners by Lightcast, our region is depicted as a hot spot for planning jobs compared to the nation as a whole, with higher than national median compensation. That report also connects Urban and Regional Planning back to geography, by listing both "Geographic Information Systems" and "Geography" as two of the top ten specialized skills listed in job postings. This concentration will develop a more specific urban-focused curriculum and couple it with geoinformatic training and familiarity with large-scale dataset analysis. Based on this, we believe there is a market for skills developed in this concentration for students graduating from Mason, and we believe GGS is an appropriate department to host this concentration.

The Geospatial Intelligence Concentration is intended to link with our existing graduate programs, as we have both a graduate certificate and a MS degree involving geospatial intelligence. Lightcast has created reports for both a Geospatial Intelligence program and the position of Geospatial Intelligence Analyst specifically. The program report shows that while 2016-2021 saw a decline in occupations overall, there was 7.13% growth in "Cartographers and Photogrammetrists" and a 13.66% growth in "Geographers". The report also lists Python,

ArcGIS, and general GIS as three of the top ten software skills for these occupations, all of which are a part of the BS GEOG degree. In the Geospatial Intelligence Analyst overview report, our region is described as having aggressive job posting demand, with much higher than national average number of employees and median compensation. This concentration is designed to leverage our departments existing geointelligence programs and our faculty's remote sensing expertise to provide undergraduate students knowledge in this topic area. Based on our department's position and the regional jobs outlook, we believe this concentration is well-suited for our department at Mason.

Total Credits Required: Total credits: minimum 120

Registrar's Office Use Only - Program Code:

SC-BS-GEOG

Registrar/IRR Use Only – Program CIP Code

Admission Requirements:

Admissions

University-wide admissions policies can be found in the Undergraduate Admissions Policies section of this catalog. To apply for this program, please complete the George Mason University Admissions Application.

Program-Specific Policies:

Policies

Students must fulfill all Requirements for Bachelor's Degrees including the Mason Core.
GGS 415 Seminar in Geographic Thought and Methodology fulfills the writing intensive requirement.
For policies governing all undergraduate programs, see AP.5 Undergraduate Policies.

Degree Requirements:

Students should refer to the Admissions & Policies tab for specific policies related to this program. ~~Geography~~
Candidates for the Geography, BS degree must complete the **Core Courses,** ~~following Core,~~ Breadth and **Experience Courses,** ~~Experience,~~ and **one concentration, all** ~~Spatial Computing courses~~ with a minimum GPA of 2.00:

Geography

Core Courses

GGS 102	Physical Geography (Mason Core)	3-4
or GGS 121	Dynamic Atmosphere and Hydrosphere (Mason Core)	
or GGS 122	Dynamic Geosphere and Ecosphere	

GGS 103	Human Geography (Mason Core)	3
GGS 110	Introduction to Geoinformation Technologies	3
GGS 300	Quantitative Methods for Geographical Analysis	3
GGS 310	Cartographic Design	3
GGS 311	Geographic Information Systems	3
GGS 415	Seminar in Geographic Thought and Methodology 1	3
GGS 485	**Capstone in Geography and Geoinformation Science**	**3**
Total Credits		24-25

1 Fulfills the writing intensive requirement.

Breadth and Experience Courses

Spatial Computing

GGS 366	**Spatial Computing**	**3**
GGS 379	**Remote Sensing**	**3**
MATH 113	**Analytic Geometry and Calculus I (Mason Core)**	**4**

Systematic Courses

Select one from the following courses: 3

GGS 301	Political Geography (Mason Core)
GGS 302	Global Environmental Hazards
GGS 303	Geography of Resource Conservation (Mason Core)
GGS 304	Population Geography (Mason Core)
GGS 305	Economic Geography
GGS 306	Urban Geography
GGS 307	Geographic Approaches for Sustainable Development
GGS 309	Introduction to Weather and Climate
GGS 312	Physical Climatology
GGS 314	Severe and Extreme Weather
GGS 321	Biogeography
GGS 340	Health Geography
GGS 344	Military Geography
GGS 357	Urban Planning
GGS 399	**Select Topics in GGS**

Regional Courses

Select one from the following courses: 3

GGS 315	Geography of the United States
GGS 316	Geography of Latin America
GGS 317	Geography of China (Mason Core)
GGS 320	Geography of Europe
GGS 325	Geography of North Africa and the Middle East
GGS 326	Geography of Eastern Europe and Russia
GGS 333	Issues in Regional Geography
GGS 380	Geography of Virginia

~~Electives~~ ~~9~~

~~Select 3 credits of GGS courses~~

~~Select 6 credits of upper division GGS courses~~

Total Credits 16

Elective Courses

Select 3 credits of GGS courses

Select 6 credits of upper division GGS courses

Geoinformatics Concentration (GINF)

Geoinformatics is a technical field of study in geography in which digital spatial information is captured, stored, processed, visualized, and analyzed. Geoinformatics encompasses theories and methods of understanding geoinformation, and broadly incorporates geographic information systems (GIS), remote sensing (RS), cartography and geovisualization, and spatial computing. Students that complete the Geoinformatics Concentration develop skills in applying spatial scientific techniques to digital spatial information, in order to address complex challenges in social and environmental systems.

Select 6 courses from the following; no more than two courses outside of the GGS prefix are permitted: 18-19

GGS 308	Field Mapping Techniques
GGS 354	Data Analysis and Global Change Detection Techniques
GGS 411	Geovisualization
GGS 416	Satellite Image Analysis
GGS 422	Drone Remote Sensing
GGS 426	Physical Fundamentals of Remote Sensing
GGS 429	Remote Sensing of the Environment and Earth System
GGS 462	Web-based Geographic Information Systems
GGS 463	RS: GIS Analysis and Application
GGS 470	Special Topics in Geographic Techniques
GGS 499	GGS Independent Study (When the topic has been approved by an advisor)
BUS 210	Business Analytics I (Mason Core)
CDS 130	Computing for Scientists (Mason Core)
CDS 292	Introduction to Social Network Analysis (Mason Core)
CRIM 320	Crime and Place
CS 112	Introduction to Computer Programming (Mason Core)
EVPP 430	Fundamentals of Environmental Geographic Information Systems
MIS 303	Introduction to Business Information Systems (Mason Core)
SOCI 313	Statistics for the Behavioral Sciences (Mason Core)
STAT 250	Introductory Statistics I (Mason Core)
SYST 130	Introduction to Computing for Digital Systems Engineering (Mason Core)

Total Credits 18-19

Geospatial Intelligence Concentration (GINT)

The geospatial intelligence (or geointelligence) concentration is designed for students to deepen their knowledge about computational approaches to geoinformation, with particular emphasis in techniques of remote sensing and digital image analysis. While geospatial intelligence has a strong Department of Defense connotation, the techniques developed in this concentration have wide applicability regarding location intelligence over a diverse range of uses and in public, private, and non-profit sectors.

Core Courses

GGS 384	Special Topics in Geospatial Intelligence	3
CRIM 310	Introduction to the Intelligence Community	3

Remote Sensing Electives

Select three courses from the following: 9

- GGS 416 Satellite Image Analysis
- GGS 422 Drone Remote Sensing
- GGS 426 Physical Fundamentals of Remote Sensing
- GGS 429 Remote Sensing of the Environment and Earth System
- GGS 470 Special Topics in Geographic Techniques (When the topic has been approved by an advisor)
- GGS 499 GGS Independent Study (When the topic has been approved by an advisor)

Intelligence Electives

Select one course from the following: 3-4

- CRIM 312 Intelligence Analysis Techniques
- CRIM 350 Counterintelligence
- CRIM 460 Surveillance and Privacy in Contemporary Society
- or GOVT 460 Surveillance and Privacy in Contemporary Society
- GOVT 346 American Security Policy
- GOVT 347 International Security
- SOCI 391 Big Data, Technology, and Society
- SOCI 405 Analysis of Social Data

Total Credits 18-19

Urban Science Concentration (USCI)

We are living in an increasingly urban world. As concentrations of human activity, cities and urban environments are data-rich, requiring geo-computational approaches to understand complex city systems and urban challenges. Through this concentration, students will apply geoinformational techniques to large-scale data to urban phenomenon like transportation, mobility, urban planning, and urban development.

Core Courses

GGS 306	Urban Geography	3
CDS 303	Scientific Data Mining	3

Urban Electives

Select two courses from the following: 1 6-7

- GGS 357 Urban Planning
- or GOVT 357 Urban Planning
- ANTH 382 Urban Anthropology (Mason Core)

ARTH 311	Design of Cities (Mason Core)	
EVPP 490	Special Topics in Environmental Science and Policy (When the topic is "Urban Smart Growth Strategies")	
GOVT 464	Issues in Public Policy and Administration (when title is "Urban Economic Development in Smart Growth Era")	
NUTR 435	Urban Agriculture	
SOCI 332	The Urban World (Mason Core)	
USST 390	Special Topics in Urban and Suburban Studies	
Mapping and Spatial Analysis Electives		
Select one course from the following:		**3**
GGS 308	Field Mapping Techniques	
GGS 411	Geovisualization	
GGS 416	Satellite Image Analysis	
GGS 462	Web-based Geographic Information Systems	
GGS 463	RS: GIS Analysis and Application	
GGS 470	Special Topics in Geographic Techniques (When the topic has been approved by an advisor)	
GGS 499	GGS Independent Study (When the topic has been approved by an advisor)	
Computational Data Science Electives		
Select one course from the following:		**3**
CDS 201	Introduction to Computational Social Science	
CDS 205	Introduction to Agent-based Modeling and Simulation	
CDS 292	Introduction to Social Network Analysis (Mason Core)	
CDS 301	Scientific Information and Data Visualization	
CDS 302	Scientific Data and Databases	
Total Credits		18-19

1 Other urban topics courses may be taken with advisor approval.

~~Core Courses Breadth and Experience Courses Spatial Computing~~		
~~GGS 366~~	~~Spatial Computing~~	~~3~~
~~or CDS 130~~	~~Computing for Scientists (Mason Core)~~	
~~MATH 113~~	~~Analytic Geometry and Calculus I (Mason Core)~~	~~4~~
~~GGS 379~~	~~Remote Sensing~~	~~3~~
~~Select four courses from the following:~~		~~12~~
~~GGS 308~~	~~Field Mapping Techniques~~	
~~GGS 354~~	~~Data Analysis and Global Change Detection Techniques~~	
~~GGS 366~~	~~Spatial Computing 2 - only if unused above~~	
~~GGS 411~~	~~Geovisualization~~	
~~GGS 412~~	~~Air Photography Interpretation~~	
~~GGS 416~~	~~Satellite Image Analysis~~	
~~GGS 422~~	~~Drone Remote Sensing~~	
~~GGS 426~~	~~Physical Fundamentals of Remote Sensing~~	

~~GGS 429~~	~~Remote Sensing of the Environment and Earth System~~	
~~GGS 462~~	~~Web-based Geographic Information Systems~~	
~~GGS 463~~	~~RS: GIS Analysis and Application~~	
~~GGS 470~~	~~Special Topics in Geographic Techniques~~	
~~Total Credits~~		~~0~~

Retroactive Requirements Updates:

Plan of Study:

Honors Information:

Honors in the Major

To graduate with departmental honors in Geography, students must have a minimum GPA of 3.50 in GGS courses, an overall GPA of 3.50, and complete the following courses each with a grade of 'B+' or above:

GGS 463	RS: GIS Analysis and Application	3
GGS 499	GGS Independent Study 1	3
3 credits of 500-699 level GGS courses 2		3

1Before registering for this course, students must have identified a topic under the guidance of a full-time faculty member following departmental guidelines.

2Eligibility for these courses is restricted to students who obtain permission from the undergraduate coordinator or those in the Accelerated Master's program.

Program Outcomes

Additional Program Information

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

Courses offered via distance (if applicable):

What is the primary delivery format for the program? Face-to-Face Only

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 instructiona 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

OAPI Use Only – Determination of SACSCOC Impact

Comments or Notes

Green Leaf Program Designation

Is this a Green Leaf program? No

List sustainabi

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: 149