

Annual Departmental Report 2021-2022

Program Information

Program/Department: Geographic Science and Technology/Earth and Geographic Sciences

Department Chair: Elizabeth Gordon

Department Assessment Committee Contact: N/A (no assessment committee)

This document is to be kept in the department and an electronic file is due to the AVP of Institutional Research & Planning by June 1, 2022.

A. Departmental Special Section for AY21-22

Department Lessons Learned and Accomplishments

Our department returned to fully in person instruction for most courses this academic year. As noted in last year's assessment report, we found that most of our students were more successful with in person (vs remote) instruction. That said, one of our introductory courses (GEOG1100, Human Geography) was offered in an online, asynchronous modality in an effort to boost enrollment. When initially listed as an in-person course, only five students enrolled. When switched to online, the course filled to capacity at 30 students. As a department, we will continue to discuss how to achieve a balance between in person instruction to support student success, while also acknowledging student demand for some online options. For the upcoming academic year (AY23), we are offering one lab course each semester in a hybrid modality, and one lab course will be offered ONSYNC. (It was notable that our fall hybrid course, Meteorology, filled to capacity before any other lab course, so there appears to be student demand for this modality as well.)

Regardless of modality, faculty members in the department observed that students continue to face academic and social challenges. We recorded more attendance issues than in prior years, as well as students' inability to complete coursework in a timely manner, if at all. Peer TAs within the classroom, used for some geospatial courses, was noted to be helpful.

Many of our courses were approved for the new gen ed, which began Fall 2021. We added a laboratory session to our introductory Earth Systems Science course (GEOG1000) to support its Scientific Inquiry and Analysis gen ed outcome, and added a math prerequisite to several of our lab courses that are taken by non-majors to align with the vertical structure of the new gen ed (building on the QR foundation outcome). One new topics course was offered - Soils and the Environment - which is designed to fill a gap in our Environmental and Earth Science curriculum. Other accomplishments included modifications to the Public Health Science major so that it is more transfer-friendly.

In an effort to prepare our students for their professional lives after graduation, we continued to offer several opportunities for students to engage in research and internships, and the department completed the career competency/curriculum mapping work funded by the Davis Foundation. We also hosted three alumni talks - two focused on work/internship opportunities and one focused on graduate school. Finally, our first Public Health students graduated in May 2022.

B. Program Learning Outcomes (PLOs) (Educational Objectives)

I. List of PLOs and the timeline for assessment.

PLO #	PLO – Stated in assessable terms	Where are the learning outcomes for this level/program published? (please specify) Include URLs where appropriate	Timing of assessment (annual, semester, bi-annual, etc.)	When was the last assessment of the PLO completed?
1.	Students will describe and analyze physical and human conditions on Earth's surface using geographic terms and concepts.	https://www.fitchburgstate.edu/academics/programs/geographic-science-and-technology-babs	Bi-annual	
2.	Students will communicate via written and oral expression with clarity, logical organization, and with effective argument using geographic data and analysis.		Bi-annual	AY21
3.	Students will identify a research problem and use relevant data and other sources of information to conduct geographic research.		Bi-annual	
4.	Students will acquire, interpret, and present spatial information by graphic means including maps, graphs, images, and other means such as databases.		Bi-Annual	
5.	Students will use geospatial technologies including GIS, Remote Sensing, and other relevant technology (e.g., GPS) for analyzing geographic phenomena, performing spatial analysis, and solving geographic problems.		Annual	AY19

II. PLO Assessment (Please report on the PLOs assessed and/or reviewed this year. Programs should be assessing at least one each year.)

Using the table below, list and briefly describe the **direct method(s)** used to collect information assessing whether students are learning the core sets of knowledge (K), skills (S) and attitudes (A) identified as essential.

PLO # (from above)	Assessment description (exam, observation, national standardized exam, oral presentation with rubric, etc.)	When assessment was administered in student program (internship, 4th year, 1st year, etc.)	To which students were assessments administered (all, only a sample, etc.)	What is the target set for the PLO? (criteria for success)	Reflection on the results: How was the “loop closed”?
2	Remote sensing final presentation	3rd/4th year	all	all students proficient (80%)	
5	Remote sensing final presentation	3rd/4th year	all	all students proficient (80%)	

You may use this comment box to provide any additional information, if applicable:

Low enrollment in the program makes assessment difficult. Assessment data above based on four students from one course.

Summary of Findings: Briefly summarize the results of the PLO assessments reported in Section II above combined with other relevant evidence gathered and show how these are being reviewed/discussed. How are you “closing the loop”?

Reflection Prompt	Narrative Response
<p>Other than GPA, what data/evidence is used to determine that graduates have achieved the stated outcomes for the degree? (e.g., capstone course, portfolio review, licensure examination)</p>	<p>PLO2: Final project/presentation for the required Remote Sensing course taken by 3rd/4th year majors.</p> <ul style="list-style-type: none"> - 75% of students were proficient and organizing and delivering an oral presentation about a research project - <p>PLO5: Final project/presentation for the required Remote Sensing course taken by 3rd/4th year majors.</p> <ul style="list-style-type: none"> - 100% of students demonstrated proficiency at analyzing remotely sensed images
<p>Who interprets the evidence? What is the process? (e.g. annually by the curriculum committee)</p>	<p>Instructor grades final presentation using a rubric with criteria for both oral communication skills (PLO2) as well as remote sensing image analysis (PLO5)</p>
<p>What changes have been made as a result of using the data/evidence? (close the loop)</p>	<p>No major changes planned - met target for PLO5 and only one student was slightly below proficient target for presentation skills</p>

C. Assessment Plan for Program/Department

- I. Insert the program or department Assessment Plan [attached](#)
- II. Explain any changes in the assessment plan including new or revised PLOs, new assessments that the program/department plans to implement and new targets or goals set for student success. [Will be discussed at the beginning of the next academic year](#)
- III. If you do not have a plan, would you like help in developing one?

D. Program Review Action Plan or External Accreditation Action Letter/Report

Annual Reflection/Follow-up on Action Plan from last Program Review or external accreditation (only complete the table that is appropriate for your program)

I. Programs that fall under Program Review:



- i. Date of most recent Review: **Oct 2020**
- ii. Insert the Action Plan table from your last Program Review and give any progress towards completing the tasks or achieving targets set forth in the plan. **See attached**




II. Programs with external Accreditation: N/A

- i. Professional, specialized, State, or programmatic accreditations currently held by the program/department.
- ii. Date of most recent accreditation action by each listed agency.
- iii. Date and nature of next review and type of review.

E. Departmental Strategic Initiatives

<p>Accomplished Initiatives AY 21-22 Add more rows as needed</p>	<p>Corresponding Strategic Plan Goal & Strategy Goal # followed by Strategy # ex: 1.3</p>	<p>Indicate if a Diversity, Equity and Inclusiveness (DEI) Goal</p>
<p>Community building and revival of student club We hosted five departmental events this year, three involving alumni. Two events had alumni discussing internship and employment opportunities and one had alumni discussing graduate school. We also organized a department hike, and co-sponsored a Fitchburg clean-up event.</p>	<p>1.2 <i>Establish a learning environment in which academic and co-curricular programs work in synergy to offer applied learning experiences that prepare students for purposeful personal and professional lives.</i></p>	<p style="text-align: center;"><input type="checkbox"/></p>
<p>Career mapping, through DEF work Reid Parsons served as our liaison to the Davis Foundation work facilitated by Sean Goodlett and Lindsey Carpenter Connors.</p>	<p>2.5 <i>Integrate career services into departments and curriculum, and build more consistent career advising across campus, especially for first-year students and sophomores.</i></p>	<p style="text-align: center;"><input type="checkbox"/></p>
<p>Professional development and curriculum integration of newly acquired drone</p>	<p>4.4 <i>Provide faculty and staff professional development opportunities and appropriate tools, including technology, to ensure they can be effective in their roles.</i></p>	<p style="text-align: center;"><input type="checkbox"/></p>

Our technician, Ian Murray, became licensed to operate our drone. Dr. Parsons incorporated a drone demo into Remote Sensing.		
Expand use of OER and further develop social justice components of departmental courses Fourteen of our courses offered in AY22 used OER in their entirety, while two courses were in the process of developing/adopting OER. Social justice continues to be integrated into our courses.	2.1 Achieve a cultural shift around how we advise, mentor, and teach all students, especially traditionally underrepresented and underserved students, so that we meet them where they are.	
Develop pathways/Early college offerings There will be one early college/dual enrollment offered over Summer 2022.	2.1 Achieve a cultural shift around how we advise, mentor, and teach all students, especially traditionally underrepresented and underserved students, so that we meet them where they are.	

Planned Initiatives for AY 22-23 Add more rows as needed	Associated Strategic Plan Goal & Strategy Goal # followed by Strategy # ex: 1.3	Indicate if a Diversity, Equity and Inclusiveness (DEI) Goal
Actualize Career competency work; examine ways to ensure equitable access to high impact practices	2.5 Integrate career services into departments and curriculum, and build more consistent career advising across campus, especially for first-year students and sophomores.	
Expand opportunities for student research and other high impact practices, including study abroad	1.2 Establish a learning environment in which academic and co-curricular programs work in synergy to offer applied learning experiences that prepare students for purposeful personal and professional lives.	
Develop pathways/Early college offerings	2.1 Achieve a cultural shift around how we advise, mentor, and teach all students,	

	<i>especially traditionally underrepresented and underserved students, so that we meet them where they are.</i>	
		<input type="checkbox"/>

F. Departmental Reflection:

Take this section to reflect on--

- 1) *Initiatives that you may be considering for 22-23 academic year that you did not already capture above.*

- 2) *Any other thoughts or information that you would like to share.*

Geographic Science and Technology Curriculum and Assessment

I. Catalog description of major requirements

Required Courses

- GEOG 1000 - Earth Systems Science 3 cr.
- GEOG 1100 - Principles of Human Geography 3 cr. ***
- GEOG 2400 - Introduction to Geospatial Technologies 3 cr.
- GEOG 3120 - Computer Cartography 3 cr.
- GEOG 4000 - Geographic Information System 3 cr. or
GEOG 4003 - Geographic Information Systems II 3 cr.
- (one of the two could count as a major elective if both are taken)
- GEOG 4500 - Remote Sensing of the Environment 3 cr.

Additional 6 Elective Courses

- GEOG 2056 - Climate Change and Human History 3 cr.
- GEOG 3000 - Geographic Economic System 3 cr.
- GEOG 3004 - GIS for Criminal Justice 3 cr.
- GEOG 3100 - Political Geography 3 cr.
- GEOG 3110 - Climatology 3 cr.
- GEOG 3200 - U.S. and Canada 3 cr.
- GEOG 3300 - Urban Geography 3 cr.
- GEOG 3400 - Population Geography 3 cr. ***
- GEOG 4001 - Web GIS 3 cr.
- GEOG 4000 - Geographic Information System 3 cr. or
GEOG 4003 - Geographic Information Systems II 3 cr. (unless used as a major requirement)
- GEOG 4200 - Geomorphology 3 cr.
- GEOG 4700 - Geographic Perspectives on Conservation 3 cr. ***
- GEOG 4940 - Internship in Geography 3 cr.
- GEOG 4950 - Internship in Geography 6 cr. or
- GEOG 4960 - Internship in Geography 12 cr. (maximum 12 credits counting toward major)
- ECON 1200 - Principles of Economics: Microeconomics 3 cr. *
- ECON 2550 - Urban Economics 3 cr. *
- POLS 1500 - State and Urban Government 3 cr. *
- POLS 1300 - Introduction to International Relations 3 cr. *

*Maximum two courses among the four counting toward the major.

Required Cognate Courses:

- CSC 1500 - Computer Science I 3 cr.
- MATH 1300 - Precalculus 4 cr. (or above)

II. Assessment Plan

The Earth and Geographic Sciences Department expects that each Geographic Science and Technology graduate should have a well-rounded understanding of geographic knowledge and skills. With this intent, the program requires the students to take a series of courses which include the following essential elements of geography.

1. The use of maps to present and interpret patterns of physical and human characteristics on the Earth's surface;
2. The distinctiveness of places and regions with respect to the integration of physical and human characteristics;
3. Description and explanation of human characteristics and their spatial distribution on the Earth's surface, including composition of population, cultural complexes, economic interdependence, settlement and political patterns;
4. Human-environment interactions, including the perception, distribution and use of natural resources.

The program provides students with opportunities to develop the following skills and understandings with respect to the elements of Geography:

1. Analytical thinking

Students will describe and analyze physical and human conditions on Earth's surface using geographic terms and concepts. Pertinent courses: Geog1000 EES, 1100 Human Geo.

2. Written and oral expression

Students will communicate via written and oral expression with clarity, logical organization, and with effective argument using geographic data and analysis. Pertinent courses: Geog2056 Climate Change, Geog3000 Econ Geo, Geog3100 Political Geo, Geog3110 Climatology, Geog3200 Regional Geo, Geog3300 Urban Geo, Geog3400 Pop Geo, Geog4200 Geomorph, Geog4700 Conservation

3. Research

Students will identify a research problem and use relevant data and other sources of information to conduct geographic research. Pertinent courses: Geog2400 Intro, Geog2056 Climate Change, Geog3000 Econ Geo, Geog3100 Political Geo, Geog3110 Climatology, Geog3200 Regional Geo, Geog3300 Urban Geo, Geog3400 Pop Geo, Geog4200 Geomorph, Geog4700 Conservation

4. Graphic expression

Students will acquire, interpret, and present spatial information by graphic means including maps, graphs, images, and other means such as databases. Pertinent courses: Geog3120 Cart, Geog3300 Urban Geo, Geog4000 GIS, Geog4001 Web GIS, Geog 4002, GIS II.

5. Geospatial technical skills

Students will use geospatial technologies including GIS, Remote Sensing, and other relevant technology (e.g., GPS) for analyzing geographic phenomena, performing spatial analysis, and solving geographic problems. Pertinent courses: Geog2400 Intro, Geog3120 Cart, Geog3300 Urban Geo, Geog4000 GIS, Geog4001 Web GIS, Geog4002 GIS II, Geog4500 RS.

Earth and Geographic Sciences Action Plan in Table Format – updated May 2022

Specific area where improvement is needed	Evidence to support the recommended change	Person(s) responsible for implementing the change	Timeline for implementation	Resources needed	Assessment Plan	Progress made AY21	Progress made AY22
Enrollments	Enrollments, while improving, remain below target	All faculty	Begin AY21	May require small but undetermined amount of funding	Increased enrollments	Attended open houses and FFDs.	Attended open houses and FFDs. Collaboration with Nursing and Health Professions advising to recruit PHS students.
Curriculum and assessment	New gen ed and associated assessment; Gaps in major courses; skill development; internship assessment	Geo faculty	AY21 – Overall discussion; gen ed proposals and assessment plan AY22 – add/modify major courses as needed AY22-23 – discuss internship assessment AY24 - evaluate	None	Addition of key courses to curriculum; gen ed designations for intro courses; continued assessment of skills; assessment plan for gen ed outcomes and internships	New gen ed designations for all gen ed lab courses and introductory geospatial courses	New gen ed designations for social geography courses; Applied for AIF to obtain course release for internship/HIP work
Capstone experience	No required capstone	Geo faculty	AY21 – planning AY22 – pilot of course-based capstone; identify earth science internships AY23 - evaluate	Course release to build internships	Addition of capstone experience to curriculum		Applied for AIF to obtain course release for internship/HIP work
Strengthen community	Limited sustained opportunities for student extracurricular engagement	All faculty	AY21 – planning AY22 – at least three events AY23 – monthly events	Not yet identified	Number of planned departmental events; attendance at said events		One hike, one clean-up (with sustainability committee), three alum events (Tristan and Sam job talk; Dorian internship and jobs; Tallie and Caroline, grad school)

Marketing	Enrollments	All faculty	1-2y: develop coherence across programs 3-5y: Departmental newsletter				
Outreach -on campus -to local high schools -to broader community	Enrollments/department recognition	All faculty	1-2y: planning 3-5y: implementation 5-7y: develop advisory board	Small amount of funding may be requested to support outreach efforts	Increased outreach activities, ideally translating into increased enrollments		
Participation in early college program	Increase enrollment in courses, possible recruitment	All faculty	1-2y		More early college students in courses		early college GEOG1000 Summer 22
Transfer friendly curriculum/Articulation agreements	Increase enrollments	Faculty develop 2yr plans; Chair to work with Heather Thomas	1-2y		Establishment of 2 yr plan; increase articulation agreements	changes to PHS major that are more transfer friendly	
Curriculum alignment -Add technology objective -GST sequencing and mapping competencies	Align curriculum with learning outcomes	Geo faculty	1-2y		Technology objective added; GST curriculum map		
Experiential learning -study abroad -capstone -field course -certificates	Expand student opportunities	Geo faculty	1-2y: planning 3-5y: implementation	Funding for 'scouting trips' to expand study abroad (or	Increase offerings of experiential learning		Study abroad planning for AY23; discussion of GIS certificate

				domesticall y); acquire relevant equipment			
Departmental Collaborations	Increase course enrollments	All faculty	1-2y: ETech 3-5y: Bio/Chem		Expansion of programs, increased enrollments of courses		Geoinformatics; Data science discussions; Digital Media Innovation; GIS-CJ added as a data analysis option for CJ major
Personnel	Additional faculty line in geography needed; technician support	Chair to request; all faculty assist in hiring process	Annual request	Costs associated with faculty hire	New geographer joins the department		Technician responsibilities adjusted to provide support to geospatial needs
Equipment acquisition	Student access to equipment that better prepares them for graduate school and employment; expand opportunities for research	Chair to request; faculty identify equipment needs	1-2y, pending budgetary resources	Costs of equipment acquisition and upkeep	Acquisition of relevant equipment		GPS units for study abroad; equipment for soil sampling