

**Improving student learning and student retention at the undergraduate level
Application Cover Sheet**

Maximum funding for any single grant: \$50,000.

Proposal must be limited to two pages plus a budget page, in addition to the cover sheet.

DIRECTIONS:

1. Complete cover sheet
2. Attach 2 page proposal summary
3. Attach 1 page budget
4. Submit your proposal electronically to your college office for approval. College offices will submit recommended college proposals to the Provost office **no later than March 16, 2007 for FY'08 funding.**

Name Timothy E. La Tour Date 03/09/2007

Department and College Affiliation Geosciences, College of Arts and Sciences

Phone 404-651-2272 Email tlatour@gsu.edu

Collaborators (other departments, if any):

Title of Your Proposal: Improving Retention and Timely Graduation Rates for Geosciences Majors (Geography & Geology)

Theme of Your Proposal (Support for students; Fostering connections; Enhancing advisement; Other innovations): Creation of a Geosciences Learning Community (GLC) in the Department of Geosciences, integrating students interested in majoring in Geography and Geology, and focusing on development of research groups which will carry out several problem-based projects.

College rating (approved; not approved) APPROVED

Department of Geosciences
Georgia State University

Retention, progression, and Graduation (RPG) proposal
Request for continuing funding

Submitted by

Dr. Pamela Burnley, Associate Professor, Department of Geosciences
Dr. Katherine Hankins, Assistant Professor, Department of Geosciences

Summary of the project

This project has created a Geosciences Learning Community (GLC) in the Department of Geosciences. The GLC integrates students interested in majoring in Geography and Geology, which are the department's two main areas of concentration. Groups of students within the GLC, or "research groups" focus on several problem-based research projects, which carry over from semester to semester. Students are permitted to enroll in the GLC for credit for two semesters.

Purpose

The purpose of a GLC and its research groups is to foster connections among students and faculty, to improve student performance, to generate interest in Geosciences, and to give students the opportunity to experience hands-on research. The goal for the GLC is to serve between 40-50 students, recruited from introductory and intermediate courses in geology and geography. At the core of the GLC experience are two or more research groups that focus on research projects that will be carried through two (or more) academic semesters, beginning in spring 2007. Each research group will be headed by a faculty advisor and a GTA or undergraduate team.¹ Students participating in research groups will receive a one-hour course credit. Students in the research groups will meet with the faculty advisor and the GTA/undergraduate teams once per week. All students in the GLC will meet at least once per month for research updates, guest speakers, field trips, and informal interactions.

Goals

The GLC and its research groups have six goals, which include to:

1. Foster a sense of "belonging" to a community of students and faculty with a shared interest in the geosciences by providing a shared space for students to congregate and providing personal locker space to students in the GLC.
2. Foster connections among students by providing students the opportunity to get to know one another in an intimate, research-focused setting.
3. Foster connections among students and faculty by involving undergraduate students, graduate students and GLC participants in joint research activities.
4. Improve student performance giving students the opportunity to get to know and work with a familiar group of peers over the course of two or more semesters.
5. Generate interest in Geosciences by exposing GLC participants to Geosciences research, which will allow for a greater appreciation for the issues and approaches taken in geography and geology.
6. Give students the opportunity to participate in problem-based learning by having students tackle "real-world" problems.

Project activities

The main activities include continuing to implementing the research projects that were initiated during spring 2007. These projects are described in the attached progress report.

Year 1: (these activities have already been funded)

¹ GTAs will be used, depending on the availability of graduate students. If graduate students are not available, teams of two junior or senior undergraduate majors will be chosen to help lead the research groups.

Fall 2006 & Spring 2007: These activities have been described in the attached progress report.

Summer 2007: Faculty advisors and GTAs/undergraduate teams will continue to meet during summer 2007 to assess the effectiveness of the research groups. They will also plan activities for fall 2007 and spring 2008, including investigation of suitable field sites and establishing infrastructural setup for in-house research activities. These are the activities for which faculty are to be paid 10% summer salary.

Year 2: GLC students will again register for the GLC course, will meet weekly, and will continue working on the research projects. New students will also be recruited to join the GLC. In addition, students who excelled in their research projects will be hired as peer mentors to help teach the incoming members of the GLC how to do research. As the number of students in the GLC increases with each semester, additional undergraduate peer mentors and research mentors will be hired. Currently we are using independent study courses (GEOL4097/GEOG4097) for the courses created for this RPG project. We will be submitting a proposal to the Arts and Sciences curriculum committee to officially create the Geoscience Learning Community course as well as the Geography and Geology in the Field courses.

Evaluation

Students will be evaluated for their participation in the research project. To assess the overall effectiveness of the project, we will ask majors in the Geosciences Department to fill out a questionnaire about their perceptions of the department during Fall 2007. Results from this questionnaire will be compared with results from a similar questionnaire that was circulated to majors during Fall 2006 and to results of an extensive questionnaire answered by students and alumni of the Geology Department for its program review in 1999. Having obtained the necessary CITI certifications, we are now in the process of devising and obtaining IRB approvals for another anonymous questionnaire specifically designed for the students who are participating in the GLC. We will begin administering this questionnaire to students as they enter the GLC in Fall 2007. The questionnaire will examine their interests and perceptions of concepts in Geosciences and the two Geoscience majors. At the conclusion of students' GLC experience, they will again be given this questionnaire to assess how their interests and perceptions have changed. Conduct of the GLC effort, including organization and evaluation, will be based on the highly successful NSF-funded ACRES program that was conducted under Dr. Burnley's direction from 1999 to 2004.

Progress report: Improving Retention and Timely Graduation Rates for Geosciences Majors (Geography & Geology)

Purpose of Project

The purpose of the project was to create a Geosciences Learning Community (GLC) in the Department of Geosciences. The GLC was envisioned to integrate students interested in majoring in Geography and Geology, which are the department's two main areas of concentration. The goals for the GLC were to:

7. Foster a sense of "belonging" to a community of students and faculty with a shared interest in the geosciences by providing a shared space for students to congregate and providing personal locker space to students in the GLC.
8. Foster connections among students by providing students the opportunity to get to know one another in an intimate, research-focused setting.
9. Foster connections among students and faculty by involving undergraduate students, graduate students and GLC participants in joint research activities.
10. Improve student performance giving students the opportunity to get to know and work with a familiar group of peers over the course of two or more semesters.
11. Generate interest in Geosciences by exposing GLC participants to Geosciences research, which will allow for a greater appreciation for the issues and approaches taken in geography and geology.
12. Give students the opportunity to participate in problem-based learning by having students tackle "real-world" problems.

Progress as of March 1, 2007

During the fall semester Hankins and Burnley, with help from the graduate assistants, planned the format of the GLC research course, decided upon research topics and did background research on the topics. Burnley and Hankins also developed two other one credit hour courses, Geology in the Field and Geography in the Field, which are intended to recruit students into the majors. An attitudes survey for majors was developed and circulated to existing majors in the Department. Power point presentations for recruiting students into the GLC, geography and geology majors were developed by the student assistants, who then made recruiting presentations to all introductory geography classes. The geology presentations will occur this spring. Flyers for the GLC as well as geology and geography in the field courses were created and circulated to all introductory level courses. During the first three days of the spring semester, presentations about the GLC and geology in the field were made in every introductory geology class. Burnley and Hankins negotiated with Geosciences faculty for a space for the Geosciences Undergraduate Lounge and purchased lockers. The Geosciences department decided to convert one of its introductory laboratory teaching spaces (Rm301 Kell) into the lounge. The lockers arrived in late January. The RPG grant provided new paint and painting supplies, and the undergraduate students painted the room and assembled the lockers. The room was ready for occupancy by mid February at which point tutors were hired. Tutors are available for introductory classes 4-5 hours per day four days a week. Professional trade journal subscriptions for students enrolled in the GLC have been purchased. The GLC course (enrollment: 12, syllabus attached) and geography and geology in the field courses (11 and 8, respectively) are being offered this semester. The focus for the GLC research projects for this semester is Stone Mountain. With the help of Dr. Eirik Krogstad Geology students are working on measuring Pb isotope ratios of K-feldspar in the granite with a goal of testing several hypotheses about the origin of the granite. This project will utilize Geosciences Laser ablation ICP- mass spectrometer and expose the students to cutting edge research tools. Pb isotope work has not been conducted on any of the granite plutons in the Atlanta area so it is anticipated that this project will ultimately lead to publishable results. The geography research team is conducting two projects on Stone Mountain. The first is assessing the cultural significance of Stone Mountain as it has changed through time. This project has been co-led by Dr. John Allensworth. The second project includes conducting an air quality assessment of the Stone Mountain region, which has been led by Dr. Jeremy Diem. With guidance from Micheal Page, the

department's computer technology specialist, the results from the geology and geography research projects will be assembled into an interactive atlas utilizing new geopdf software. The atlas will be published on the department's web site. The project has produced a great sense of excitement among the students in the department and been instrumental in integrating the geology majors and geography majors into a single social community.

Report prepared by:
Pamela Burnley &
Katherine Hankins
March 8, 2007

GEOSCIENCES LEARNING COMMUNITY

Instructors:	Pamela Burnley	Katherine B. Hankins
Office:	336 Kell	349B Sparks
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E-mail:	burnley@gsu.edu	khankins@gsu.edu
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Assistants: Tara Prizito, tara_dancer1@yahoo.com
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Travis Pruitt, tpruitt1@student.gsu.edu, Office hours (in 301 Kell): M/W: 1:30-2:30
Liz Stewart, starry1307@yahoo.com, Office hours (in 301 Kell): T/Th 2:30-3:30
Barbara Smucygz, bsmucygz1@student.gsu.edu

GOALS AND OBJECTIVES

This course is designed to expose students to professions that utilize training in the geosciences. In the class, students will conduct a research project and learn about a sampling of geosciences research techniques and tools.

CLASS MEETINGS: TUESDAYS 4 – 4:50 p.m. 314 Kell Hall

ATTENDANCE AND PARTICIPATION

Credit for this course is based on attendance and participation during the class meetings and field trips. The following rubric is a general outline for how course grades will be assigned:

- A** misses <2 meetings (not including the field trip) and contributes well to his/her research team
- B** misses 3 meetings or did not contribute enough to the research team
- C** misses 5 meetings or made minimal contribution to the research team
- D** misses 6-7 meetings and made minimal contribution to the research team
- F** misses >7 meetings, did not contribute to research team

IMPORTANT DATES

Field trips to Stone Mountain are scheduled for Saturday, **February 17th** and Saturday, **March 31st**.

PRIVILEGES AS A GLC STUDENT

- Access to the new GLC undergraduate lounge (301C Kell)

- Personal locker space
- A free one-year subscription to a geology or geography trade magazine/association

CREATING AN INTERACTIVE ATLAS OF STONE MOUNTAIN

Schedule*

Week 1 (Jan 9)	Introduction to GLC
	Go over outline of the semester, pass out syllabus, provide contact information, explain research project.
Leaders	All

Week 2 (Jan 16)	Doing Research in the Geosciences
	What are the geosciences? What is a research project? What is the scientific method? What are different methodologies? Explain the components of the Interactive Atlas.
Leaders	Hankins; Burnley

Week 3 (Jan 23)	How to Read Topographical Maps and How to Use a Compass
	Distribute topo maps of Stone Mountain, learn how to read the maps, how to use a compass
Leader	Prizito

Week 4 (Jan 30)	Using GPS
	Demonstrate how to use hand-held GPS units; conduct a mini-field exercise around campus capturing GPS data points
Leader	Prizito

Week 5 (Feb 6)	Data Collection Methods and Digital Photo Editing
	Demonstrate how to collect data from topo maps, compasses, GPS units, how to compress digital photography files, and how to enter/manipulate data in excel spreadsheets
Leader:	Page

Week 6 (Feb 13)	Geography Research Group	Geology Research Group
Topic	Understanding the Cultural Significance of Stone Mountain Outline fieldtrip goals	What Pb isotopes can tell us about the origin of the Stone Mountain granite
Leader	Hankins, Allensworth	Burnley, Krogstad

Week 7 (Feb 17*)	Field trip to Stone Mountain
SATURDAY (no class on Tuesday, Feb 20)	Collect samples and other data. Use topo maps, compass, GPS, and digital photos to record location of data
Leaders:	All

Week 8 (Feb 27)	Geography Research Group	Geology Research Group
	Data Analysis Understanding the patterns revealed by the data; entering data into Atlas database	Sample preparation How to cut and polish rocks and how to make digital photographs of sample surface.
Leaders	All	Burnley

Week 9 (Mar 6) Spring Break (no class)

Week 10 (Mar 13)	Geography Research Group	Geology Research Group
Topic	Air Quality and Ozone Monitors Explain concepts of air quality and ozone concentrations; demonstrate how to use ozone monitors to assess air quality	Pb Analysis using the LA-ICPMS Tour of instrument, manipulation of ICPMS data.
Leader	Diem	Burnley, Krogstad, Malchow

Week 11 (Mar 20)	Geography Research Group	Geology Research Group
Topic	Field trip prep	ICPMS* time to be announced
Leader	Hankins, Prizito, Beringer	

Week 12 (Mar 31*)	Field trip to Stone Mountain	
SATURDAY	Geography Research Group	Geology Research Group
(*no class Mar 27)	Capture ozone data; assess environmental factors	ICPMS* time to be announced
Leaders	All	

Week 13 (Apr 3)	Data Analysis	
	Understanding the patterns revealed by the data; entering data into Atlas database	
Leaders	All	

Week 14 (Apr 10)	Careers in Geosciences	
	Two invited guests to speak about careers in Geosciences	

Week 15 (Apr 17)	Careers in Geosciences	
	Two invited guests to speak about careers in Geosciences	

Week 16 (Apr 24)	Unveiling of Interactive Atlas of Stone Mountain & Party	

***This syllabus represents a plan for the course. Deviations announced to the class by the instructors may be necessary.**

Policies you should know:

Policy on Academic Honesty: In this class we will follow the University system policy on academic honesty that is published in *On Campus: The Undergraduate Co-Curricular Affairs Handbook* and is available to all members of the university community. The policy represents a core value of the university and all members of the university community are responsible for abiding by its tenets. Lack of knowledge of this policy is not an acceptable defense to any charge of academic dishonesty. All members of the academic community - students, faculty, and staff - are expected to report violations of these standards of academic conduct to the appropriate authorities. The minimal penalty for cheating in this class is the grade of F.

Computer Access: Each student must have access to an on-line computer and is responsible for reading all messages sent to his/her university email address, and any other assignments that require the use of a computer. Class changes and/or updates may be conveyed via email, in which case the student is considered to have been informed. The student is required to check this university email box regularly. If you do not want to check your student e-mail box, you should see to it that your student e-mail is forwarded to an account that you do read regularly.

Attendance & Time Commitment: Weekly attendance is very important (see "Attendance and Participation"). Missed classes cannot be 'made up'. The university requires instructors to verify attendance early in the term. Failure to attend classes may result in you not appearing on the Verification Roll and being dropped from the class. Please see section 1334 of the catalog at http://www.gsu.edu/es/catalogs_courses.html, and click on the appropriate catalog link to read about attendance policy (posted as a .pdf file).

Withdrawal Policy: The last day to withdraw from the class and possibly receive a "W" is March 1, 2007. Unless hardship status is granted by the Office of the Assistant Dean of Students, any withdrawal after March 1, 2007 will result in a "WF". The last day to drop this class and receive a "WF" is April 16, 2007. After that point you will receive a grade for taking this class even if you stop attending. The new campus policy regarding withdrawals can be found at: <http://www.gsu.edu/es/20399.html>

Accommodations for students with disabilities: Georgia State University complies with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Students with disabilities who seek academic accommodations must first take appropriate documentation to the Office of Disability Services locate in Suite 230 of the New Student Center.

Budget tied to goals

Leading the two research groups in the GLC requires two faculty members and two GTAs/undergraduate teams. Summer support (10% each) for faculty members is requested and two semesters of support for GTAs/undergraduate teams is requested. Support for undergraduate peer mentors and student recruiters who will staff office hours and visit introductory classes is requested. In spring 2008 funds are requested for experienced undergraduate GLC members (who have already participated for 2 semesters) to assist in the program. Magazine subscriptions (\$35 each for 40 students) are included because some of our existing faculty had subscriptions as undergraduates and remember how it gave them a sense of professionalism and belonging. Honoraria for guest speakers are also requested. During the spring of 2007 the Geosciences Department and the ICPMS laboratory covered the costs associated with the use of the ICPMS. However, this is not sustainable for the laboratory. Therefore, we are requesting recharge costs for the Laser Ablation ICPMS (4 half days at \$350/half day each semester). The license for the software that the GLC is using this semester to create the interactive atlas, was purchased on a prior tech fee award and will expire next year. Therefore, we are requesting funds to pay for a new license. Other supplies needed for the research groups include ozone patches (\$90 per package), field notebooks (40 @ \$8 each), and consumables including topographic maps, batteries for GPS units, mounting epoxy, grinding grit and rock saw blades. Although the students are producing the sample mounts for the LA-ICPMS work, experience has taught us that making thin sections useful for optical work is beyond the scope of a beginner. Therefore, we are requesting funds to have thin sections professionally made (\$25 each) for a few samples each semester so that the students can examine representative samples under the microscope. We feel that it is important to let the students know that the department values their achievement. Therefore, we are also requesting funds for refreshments for the reception associated with the presentation of the student's work at the end of the semester.

	Fall 2007	Spring 2008	Summer 2008
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Faculty summer salaries			
Burnley			\$6,000
Hankins			\$5,000
Geography in the field coordinator			\$5,000
Geology in the field coordinator			\$5,500
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GTA			
Geography GTA	\$3,000	\$3,000	
geology GTA	\$3,000	\$3,000	
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Undergraduate mentors			
4 recruiters/peer advisors (5 hrs./week @ \$9.00/hour for 15 weeks)	\$2,400	\$2,400	
3 geography undergraduate research helpers (5 hrs./week @ \$9.00/hour for 15 weeks)		\$1,800	
3 geology undergraduate research helpers (5 hrs./week @ \$9.00/hour for 15 weeks)		\$1,800	
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Supplies

Magazine subscriptions	\$1,400		
Honoraria	\$250	\$250	
Ozone patches	\$90	\$90	
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Rite in rain notebooks	\$320		
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Professionally made thin sections	\$50	\$50	
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One license for specialized geospatial software	\$800		
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Atlas presentation reception	\$75	\$75	
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ICPMS lab recharge costs	\$1400	\$1400	
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Other supplies (toposheets, batteries, mounting epoxy, saw blades, grinding grit)	\$220		
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Total	\$13,005	\$13,865	\$21,500
Year 2 Total			\$48,370