ATTACHMENT A

PROPOSAL FOR COURSE CHANGE

To: Curriculum Committee or Graduate Council (as appropriate)

From: Physical Sciences Department, Geology Program

Date submitted:

Request for: Course change_____ Course deletion_____ Course addition____X____

Submitted by: Dr. Jason Patton, Assistant Professor of Geology

Approved by: Department Head: Jeff Robertson Jeff W. Robertson

Dean of School [signature] 9-3-08

Reviewed by: Registrar: Tammy Rhodes 9/11/08

Vice President:

I. **Catalog description:** (AS IT WILL APPEAR IN THE CATALOG).

Number: GEOL 3174

Title for Catalog: Computer Applications in Geology

*Title for Course Inventory (24 characters): Comp. Appl. in Geology

Description: Participants will focus on mastering common geotechnical, oil and gas, and Geographic Information Systems (GIS) software utilized throughout the geologic profession. Course will include techniques on GIS analysis; generating stratigraphic sections, cross-sections, structure contours, fence diagrams, rose diagrams, and other geologic documents; geologic data management.

12-10-08 KR

Effective date or term: As soon as possible (Spring 2009).

*Course fees: $20.00

II. **Justification and feasibility of course:**

A. What is the need for this course? Who will take it?

Recent geologic industry trends are requiring personnel with advanced computer analysis skills. The topics covered in this course will be directly tied to a typical professional geologist's technical expertise needs. This course will serve to meet the industry skill level requirements by providing ATU geology majors with significant technological advantage in the marketplace. Designed for junior level majors, skills gained from this course will also be integrated in other upper-level geology courses.

B. How does it relate to other work being offered by your department? Is there an overlap with other courses in the department?

appCC 11/14/08
appFS 12/3/08

The department currently offers courses that teach traditional (paper) methods of generating many of these technical documents. Currently, there is no direct overlap. Successful completion of this course will allow students to apply techniques learned here to other upper-level courses, thereby widening the student's exposure level and reinforcing their technical knowledge.

C. Is this course part of any general plan of development within your department?

Geology faculty have recognized the growing need for these advanced computer analysis skills over the last several years. As such, the geology program has purchased hardware and software needed for students to acquire these skills. In addition, the program has recently hired Dr. Jason Patton to specifically meet the technical needs of the students and program. The addition of this course will further the program's current plan by providing a formal academic setting to acquire these skills.

D. How often will the course be offered?

This course will be taught each spring semester.

E. How will the course be staffed?

Dr. Jason Patton from the Geology program will teach the course.

F. When applicable, state with which departments you have specifically coordinated this change? (If unable to identify coordinating departments that change affects, Academic Affairs can offer assistance in identifying course use.)

It is not thought that this new course offering will affect other department's offerings in any way. As such, no other departments have been notified.

III. Integration with the assessment plan:

This course will help produce technologically proficient graduates with the computer application skills found in the geologic discipline in business and industry. It will help us evaluate our assessment goals of: (1) "producing graduates with the analytical, mathematical, laboratory, field observational, and computer skills necessary for solving problems"; and (2) "graduates will have acquired the ability to effectively conduct geological investigations."

GEOL -3174: Computer Applications in Geology, Spring 2009

Instructor: Dr. Jason Patton, P.G.
Office: McEver 6B
Telephone: 968-0676
Email: jpatton@atu.edu
Office Hours:

Class Meeting Times: Lecture: TBA
Lab: TBA

Catalog Course Description: Participants will focus on mastering common geotechnical, oil and gas, and Geographic Information Systems (GIS) software utilized throughout the geologic profession. Course will include techniques on GIS analysis; generating stratigraphic sections, cross-sections, structure contours, fence diagrams, rose diagrams, and other geologic documents; geologic data management.

Texts: Lab Manual in development.

Justification for the course: Physical Geology serves as the foundation course for students majoring in geology and also serves to satisfy the physical science requirement in ATU's general education program.

Course Objectives: Upon satisfactory completion of the course, students will be able to:

1. Understand primary functionality of common geologic software.
2. Understand basic principles of coordinate and projection systems, including dataset conversion between systems.
3. Perform advanced mapping and plotting in GIS environment.
4. Understand applicable data structures and techniques utilized in conversion and importation.
5. Generate common geologic documents utilized throughout geology industry.
6. Understand basic principles of three-dimensional mapping and visualization techniques.
7. Develop an awareness of critical nature of technology in advanced geologic analysis.

Grading Criteria: There will be four major projects and four assignments during this course that will constitute the entire grade. Each of the assignments will be structured such that completion of the assignment will further work on the individual projects. Completion of the assignments in a timely manner will be critical to completing each project.

Four Projects	75%
Four Assignments	25%

Grading Scale:	100-90% A
	89-80% B
	79-70% C
	69-60% D
	< 60% F

GEOL 3174 - Spring 2009 Schedule

GIS	1/20/09	Introduction to Course, Syllabus
	1/22/09	Introduction to Geographic Information Systems (GIS)
		Lab: Exploring ArcGIS Interface
	1/27/09	GIS Data Formats and Projections
	1/29/09	GIS Data Types: Raster vs. Vector
		Lab: Adding Data/Reprojecting
	2/3/09	Data Creation: Point & Line Shapefiles
	2/5/09	Data Creation: Polygon Shapefiles
		Lab: Project 1 - Create Geologic Map
	2/10/09	Data Creation: Importing Text Data
	2/12/09	Data Creation: Importing Other Data
		Lab: Importing Oil & Gas Data from AR Oil & Gas Commission
	2/17/09	Data Creation: Structure Contour Map
	2/19/09	Data Creation: GPS Data
		Lab: Collecting and importing GPS data.
	2/24/09	Plotting/Cartography: Designing a Map
	2/26/09	Plotting/Cartography: Advanced Map Printing
		Lab: Project 2 - Final Geologic Map
	3/3/09	Introduction to Analysis
	3/5/09	Introduction to Analysis
		Lab: GIS Analysis Problem
ROCKWORKS	3/10/09	Rockworks: Introduction to Rockworks Interface/Terminology
	3/12/09	Rockworks: Rockworks Data Structure
		Lab: Create Stratigraphic Column
	3/17/09	Rockworks: Building a Rockworks Database
	3/19/09	Rockworks: Building a Rockworks Database
		Lab: Creating Geologic Documents
	3/24/09	
	3/26/09	**Spring Break**
	3/31/09	Rockworks: 3-D Plotting
	4/2/09	Rockworks: 3-D Plotting (cont.)
		Lab: Project 3 - Rockworks
PETRA	4/7/09	Petra: Introduction to Petra Interface/Terminology
	4/9/09	Petra: Data Structure
		Lab: Importing Oil & Gas Data from AOGC
	4/14/09	Petra: Stratigraphic Data
	4/16/09	Petra: Downhole Mapping
		Lab: Creating Structure Contours & Isopach Maps
	4/21/09	Petra: Production Data in Petra
	4/23/09	Petra: Analyzing Production
		Lab: Production Decline
	4/28/09	Petra: Dealing with Faults
	4/30/09	Petra: 3-D Analysis
		Lab: Project 4 - Petra