

# GLG410/598: COMPUTERS IN EARTH AND SPACE EXPLORATION

## TERM PROJECT GUIDELINES

**Primary goal:** The goal of the term project is to provide you with an opportunity to research a specific topic, develop your own ideas about that topic and analyze them using tools and approach learned in class, present the ideas in the form of a scientific paper, and communicate those results in the form of an oral presentation to the class. As scientists, this type of work is your most essential form of communication.

**Overview:** The paper should follow the general style of a scientific journal article (see “Components” below for details). You must make use of both MATLAB and ArcGIS in your project.

To make it easier to meet deadlines at the end of the semester, the term project will be divided into four parts: proposal, preliminary results, paper, and a class presentation. These parts are as follows (you should make a web page that hosts the various components of your final project):

*Proposal:* The proposal should be ~1 page long, and should include one paragraph describing the proposed project, 1-3 references relating to the project, and 1-2 general figures that pertain to the project. In the proposal, you should also specify how you plan to utilize MATLAB and ArcGIS in your analysis.

*Preliminary results:* You should prepare a web page with your preliminary results (figures, discussion, etc.) for evaluation and guidance. You will meet with us to discuss formally your project progress after you have placed this material online.

*Paper:* The paper should be ~8 pages long using normal fonts/margins/spacing, etc. (i.e., 12 pt. Times Roman, 1” margins, double spacing). This length does not include figures, figure captions, and references. Papers significantly longer than the maximum page limit will be returned for revisions.

*Presentation:* The presentation should be ~10 minutes long, and should include a synopsis of the information from your project. We will discuss the details of the presentation later in the semester.

**Topics:** You should meet with us to discuss your project topic in advance of the proposal deadline (see below). You may choose any general Earth sciences topic that interests you. We suggest (but certainly do not require) that you pick a topic that can assist you in your thesis or dissertation research, or with another class project if applicable.

**Due dates:** You should have begun thinking about this project already, but now is the time to focus more directly on it. We expect that you will devote significant time and energy to this project over the remainder of the semester. To avoid leaving things to the last minute (as all of us tend to do), the project will be developed throughout the semester. See the dates below for each portion of the term project.

Date	Item
03/26/2009	<b>Proposal due</b>
04/16/2009	<b>Preliminary results due</b>
05/05/2009	<b>Paper due</b>
05/07/2009	<b>Presentations</b>

**Grading:** Your term project will be graded on clarity, organization, use of MATLAB and ArcGIS, figures and illustrations, and your oral presentation. See the attached sheets for specific components that will be used in this evaluation. Points for each part of the project are as follows:

**Proposal:** 50 points  
**Preliminary results:** 25 points  
**Paper:** 125 points  
**Presentation:** 50 points  
**TOTAL:** 250 POINTS

**Components:** While you should choose the exact organization of the paper, here is one possible format to follow:

- Abstract:* The abstract provides a concise synopsis of the details of the paper. It is generally 1 paragraph long. Particular emphasis should be placed on the results and implications of the research.
- Introduction:* This section provides background material and motivation for the work discussed in the body of the paper. It is generally short (1-3 paragraphs), and sets the stage for the rest of the paper.
- Data and Methods:* This section provides the technical details regarding how data was collected and processed, particularly if the process is new or a significant modification to previous analysis methods. Here, you will discuss the algorithms that you developed to analyze the data and the ways that used the computer tools to achieve your result.
- Discussion:* The discussion is used for interpretation of the data. This section generally evaluates the implications of the results of the current study and how they relate to the results of previous studies. The discussion sets the stage for the conclusions section.
- Conclusions:* This section is NOT a repeat of the abstract. It is generally used to clearly explain the well-constrained results, identify the less well-constrained results, and discuss new directions to investigate in future work. New material (i.e., more data, discussion of previous studies) is not included in this section.

Other components:

*References:* Use a standard reference style (i.e., GSA Bulletin, Journal of Geophysical Research, etc.).

*Figures:* We strongly suggest that and encourage you to create original figures that synthesize the results of several studies. For figures that are directly copied from other papers, provide a reference to that paper. Please number all figures, beginning with Figure 1. All figures must be referred to in the text.

*Figure captions:* The figure captions tell the story for each figure. Your captions should be concise and to the point, but not so short that it is impossible to determine the figure content without searching through the main body text. Clearly identify all symbols, line styles, etc.

## **MORE PROJECT DETAILS**

### **PLAGIARISM**

There is a significant difference between plagiarizing and summarizing someone else's ideas. While you are expected to conduct original thinking in the paper, you are not expected to perform original research for it. Therefore, while direct quotes are not allowed, use copious referencing in your paper. If you are not sure whether you are plagiarizing someone's work or not, please ask!

### **FIGURES AND FIGURE CAPTIONS**

Figures should always be accompanied by a descriptive figure caption that includes the reference from which the figure originated. If the figure is your own creation based on the work of others, include a phrase such as "developed from Smith et al. [1990]" to avoid potential plagiarism issues. The caption should include a description (in your own words) of the key points of the figure, including items denoted by symbols, varying line types or widths, or color, as well as a brief summary of the pertinence of the figure.

### **ORAL PRESENTATIONS**

**Length:** ~10 minutes

**Format:** The presentation should be given in a lecture-style professional format using a specially prepared web page (or set of them) with graphics that is designed to illustrate your presentation. All members of the audience will write a short, anonymous critique of the presentation, and will include at least one question to help clarify points or provide more information about your presentation.

**Grading:** You will be graded on creativity, clarity, and coherence of your presentation. See the attached sheet for specific components that will be used in this evaluation.

**GLG418/598G: GEOPHYSICS**  
**FALL 2006**  
**TERM PROJECT PAPER GRADE SHEET**

**Author's Name** \_\_\_\_\_

<b>Component</b>		<b>Points Possible</b>	<b>Grade</b>
<b>Clarity:</b>	Is the paper well-written, including proper grammar, sentence structure, and spelling? Is the paper properly motivated by introductory background material?	<b>25</b>	
<b>Coherence:</b>	Are the author's points well-developed and presented in an ordered, logical manner?	<b>25</b>	
<b>Creativity:</b>	Does the author evaluate competing hypotheses? Does the author develop new material or develop conclusions based on the work of others?	<b>25</b>	
<b>Tools/figures:</b>	Did the author make effective use of MATLAB and ArcGIS? Are the figures and figure captions effective in communicating the author's points?	<b>50</b>	
<b>TOTAL</b>		<b>125</b>	

**Additional Comments:**

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**TERM PROJECT ORAL PRESENTATION GRADE SHEET**

**Presenter's Name** \_\_\_\_\_

**Date** \_\_\_\_\_

<b>Component</b>		<b>Points Possible</b>	<b>Grade</b>
<b>Clarity:</b>	Was the presentation easy to understand and properly motivated by introductory background material?	<b>15</b>	
<b>Coherence:</b>	Did the presenter provide information in an ordered, logical manner?	<b>10</b>	
<b>Creativity:</b>	Did the presenter develop new material or develop conclusions based on the work of others?	<b>10</b>	
<b>Use of figures:</b>	Were the figures easy to read and effective in illustrating the presenter's points?	<b>15</b>	
<b>TOTAL</b>		<b>50</b>	

**Additional Comments:**