Likely topics to be considered (will depend somewhat on student background, interest and the mood of the instructor):

- Review of Basic Stuff
- Analysis of Sequences
- Time Series Analysis
- Spectral Analysis and Fourier Series
- Filtering of 2-D and 3-D Data Sets
- Fractals in the Geosciences
- Gridding and Interpolation
- General Least Squares Fit
- Cluster and Factor Analysis
- EOF Analysis
- Map Analysis (lines, patterns)
- Lines and Crossovers

Quantitative skills are becoming more and more important in the Earth Sciences. With the rapid development of remote sensing from satellites and remotely operated vehicles, the amount of data an Earth scientist must process and interpret is overwhelming; being able to analyze data on a computer becomes a necessity and often a job requirement. This course is the second of two GG courses on how to quantitatively analyze data in the geosciences. Topics that might be covered include the analysis of sequences, time series and spectral (Fourier) analysis, filtering of 2-D and 3-D data sets in the time and frequency domains, fractals and their use in geology and geophysics, triangulation, gridding, and interpolation of 3-D data sets, factor and cluster analysis, empirical orthogonal function (EOF) analysis, map patterns and crossover analysis. Computer applications of the various techniques will be implemented and applied to typical data sets in the geosciences. Homework will be assigned, covering both theoretical material and practical, computer-oriented assignments. All computing will be done in Matlab on the GG department's workstations. There will be some homework problems and a class project, in which students analyze a data set of their choice using the techniques discussed in class.

Recommended (not required) text: J. C. Davis, *Statistics and Data Analysis in Geology*, 3rd Edition, John Wiley Press. The main text will be heavily supplemented by lecture notes.

Prerequisites: GG313 or instructor's consent.

† The foundation for this class is laid in GG313 – Geological Data Analysis, which presents elementary probability and statistics, statistical tests, curve fitting, simple and multiple regression, basic spectral analysis, and analysis of directional data.