MATH 384  
Applied Regression and Design of Experiments.  
Fall 2004

Instructor: Dr. Oleg Makhnin  
Office: Weir 223

Office Hours:  
M, W, F  9-9:50 am  M, W  1-1:50 pm  T  2-3 pm  or by appointment

E-mail: olegm@nmt.edu  
Web site: www.nmt.edu/~olegm/384/  
Phone: 835-5110

Catalog description:  
"Design of experiments, analysis of variance and covariance, linear and nonlinear curve fitting. Applications are taken from metallurgy, mining and petroleum engineering, hydrology and other disciplines"

The course is oriented towards using statistics in your research. We discuss theoretical concepts on as needed basis, but the emphasis is on applications: designing your experiment, picking the correct method of analysis, setting up the model, obtaining and interpreting computer output, making corrections to your model and so on...

List of Topics:

* Review: especially linear regression.
* Alternatives to linear regression: polynomial, transforms (log and power laws, sqrt etc.)
* Multiple regression and variable selection procedures, diagnostics.
* Design of experiments.
* ANOVA: one- and two-way.
* ANOVA: random-effects models
* Logistic regression and Generalized Linear Models.
* ANCOVA
* Time series

COURSE POLICY

One meeting a week will be in the lab (location TBA). The lab assignments are based on SAS software. They are typically due the next class meeting.

You are encouraged to seek help from the instructor.
Your course grade will be determined on the basis of combined scores from Exams, labs, Homework and a Project. In order to make up any assignment, a valid excuse should be documented. The instructor decides if an excuse is a valid one.

**Exams:** There will be three in-class tests, and a comprehensive final exam.

**Homework:** All homework is due at the beginning of the lecture. Two lowest scores will be dropped.

**Grading** is based on the percentage of total points earned (the individual tests, labs etc. are not assigned a letter grade).

Distribution of points:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
<td>300 pts</td>
</tr>
<tr>
<td>Homework</td>
<td>100 pts</td>
</tr>
<tr>
<td>Labs</td>
<td>130 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>120 pts</td>
</tr>
<tr>
<td>Project</td>
<td>50 pts</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>700 pts</td>
</tr>
</tbody>
</table>

**Grading Scale** (tentative):

A: 90-100%;  B: 80-89%;  C: 70-79%;  D: 60-69%;  F: 0-59