STAT 511          Spring 2002

Course Information

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Textbooks:

Rencher, A. C,  
Linear Models in Statistics  

Neter, Kutner, Nachtsheim & Kutner,  

Course Web Page:

http://www.public.iastate.edu/~kkoehler/stat511/stat511.html

Supplemental Readings:

Supplemental readings will be posted on the Electronic Reserve System of the Parks’ Library. A link to this site will be created on the course web page.

Other books have been put on reserve at the Parks’ Library Reference Desk. A list of these books is available from the course web page.

Course Notes:

As they become available copies of transparencies will be available from the course web page. These are dbf files with four slides per page.
Computation:

One objective of this course is to introduce S-PLUS. Data files and files containing examples of S-PLUS and SAS code can be copied from the course web page. One book that provides information and examples for performing calculations and making graphs and displays with S-PLUS is


References to this book appear in the course notes.

Grades:

About nine assignments (15%)
Midterm exam (25%)
Take home exam (25%)
Final Exam (35%)

You should have a calculator that you can bring to exams.

S-Plus 6 for Windows

On the PC’s in Snedecor 321

For a free copy for your own PC contact

Sheri Martinez, 117 Snedecor

S-Plus 5.2 for Unix

On the VINCENT network of workstations

SAS

Available on PC’s and on the VINCENT network of workstations

Course Outline

<table>
<thead>
<tr>
<th>Topic</th>
<th>Readings</th>
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<tbody>
<tr>
<td>1. Matrix algebra, graphs, S-PLUS computations</td>
<td>Rencher, Chapters 1-3 Getting Started with S-Plus 6 for Windows (S-Plus online help)</td>
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<tr>
<td>2. Linear Models: Least Squares Estimation</td>
<td>Rencher, Ch. 11 (ANOVA) Chapter 7 (Regression)</td>
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<td>3. Linear Models: Normal Theory Inference</td>
<td>Rencher, Chapters 4 &amp; 5</td>
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<tr>
<td>4. Linear Models: ANOVA, Unbalanced Experiments</td>
<td>Rencher, Chapters 13 &amp; 14 NKNW, Chap. 22, Sec. 23.6</td>
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<tr>
<td>7. Generalized Linear Models</td>
<td>Rencher, Chapter 17 NKNW, Chapter 14</td>
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References

I. Matrix Algebra:


II. Linear Models:


III. Mixed Models


IV. Bootstrap and resampling methods


V. Non-linear Models:


VI. Generalized Linear Models:


VII. Model Free Curve Fitting


Information on S-PLUS:

Manuals: (Available in Snedecor 115)

- S-PLUS 5: Guide to Statistics for UNIX
Books


Websites:

- Insightful’s S-plus home page
  http://www.splus.com/

- FAQ by Insightful (frequently asked questions)
  http://www.insightful.com/support/faq.asp

- FAQ for S-Plus
  http://www.stat.math.ethz.ch/S-FAQ/

- S-News (a mailing list for S and S-Plus)
  http://www.biostat.wustl.edu/s-news/

- Venables & Ripley
  http://www.stats.ox.ac.uk/pub/MASS/

- Statlib: http://lib.stat.cmu.edu
  – click on S Archive to see a list of contributed S software
  – Click on S-News to access a searchable database of mail messages to the S-News mailing list.

- R home page (free system)
  http://www.stat.auckland.ac.nz/r/proj.html