STAT 6341
Numerical Linear Algebra and Statistical Computing
Course Information

Instructor: Dr. Larry P. Ammann
Office hours: TTh 4:00-5:00 pm, others by appt.
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Office: FO 2.410C
Phone: (972) 883-2161
Recommended text: Modern Applied Statistics with S, 4th Ed.
Authors: W.N. Venables and B.D. Ripley
Additional resources: Matrix Computations
Authors: G. Golub and C. van Loan

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Tentative Schedule

<table>
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<th>Topics</th>
<th>Chapters</th>
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<tr>
<td>Introduction to the S language and statistical programming in \textbf{R}</td>
<td>VR 1-3</td>
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<tr>
<td>Simulation</td>
<td>class notes</td>
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<tr>
<td>Numerical linear algebra</td>
<td>class notes</td>
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<td>QR decomposition and least squares regression</td>
<td>VR 4-5</td>
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<td>Data explorations</td>
<td>VR 6-7</td>
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<td>Statistical models</td>
<td>class notes, VR 11</td>
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<td>SVD and multivariate data</td>
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This course will make use of the statistics programming language \textbf{R}. Pre-compiled binaries for \textbf{R} are freely available for Windows, MacOS, and Linux at \url{http://cran.r-project.org}
An online introduction to \textbf{R} is located at \url{http://cran.r-project.org/doc/manuals/R-intro.html}

Course grade will be based on homework projects using \textbf{R}.

Student Learning Objectives
Understand numerical, statistical, and computational issues associated with major matrix decompositions, LU, QR, SVD used for statistical models. Become familiar with developing
and performing simulation studies. Understand how to express basic mathematical and statistical problems in a high-level statistical programming language.

**Course Pre-requisites, Co-requisites, and/or Other Restrictions**
See catalog

**Course Description**
See catalog

**Required Textbooks and Materials**
Listed under Course Information above

**Suggested Course Materials**
Listed under Course Information above

**Course Policies**
Make-up exams
With prior arrangement.

**Student Conduct & Discipline**
*These descriptions and timelines are subject to change at the discretion of the Professor.*

Refer to

provost.utdallas.edu/syllabus-policies/
for current UTD policies and procedures.