# Syllabus – Math676 – Spring 2014
## Statistical Methods, Part II

Instructor:     Dr. Xin Dang                 Office hours:  T Th 8:30-10:30 or by appoint.
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Class time:     T Th 1:00-2:15pm             Place:         Hume Hall 331
Textbook:       *Applied Linear Statistical Models* by Kutner, Nachtsheim, Neter, and Li, 5th
                edition, McGraw-Hill, 2004

**Goal**:
Linear statistical models for regression, analysis of variance, and experimental design are widely used today in business administration, economics, engineering and the social, health and biological sciences. Successful applications of these models require a sound understanding of both the underlying theory and the practical problems that are encountered in using the models in real-life situations. This course follows Math675, covering the second parts of the textbook: ANOVA models and experimental design. The goal is to seek blending theory and applications effectively, avoiding the extremes of presenting theory in isolation and of giving elements of applications without the needed understanding of the theoretical foundations. Through out the semesters, students will practice data analysis and implementation of the introduced methods using Statistical Analysis Software (SAS) and will gain experience of solving practical statistical problems involving real data sets.

**Course outline:**
1. One way, two way ANOVA models and higher order treatment structures.
2. Estimation of variance components. Multiple comparisons. Testing contrasts.
3. Experimental design: balanced designs, nested designs, repeated measure designs, Latin squares and similar designs.
4. Random effects, randomized block designs.
5. Split-plot designs, split-split-plot designs.

**Grading:**

Homework **30%**   Quizzes **30%**,     SAS projects **40%**

>90%=A,  80%-90%⁻=B, 70%-80%⁻=C,  <70%⁻=D

**Important:**
1. Totally 8 homework assignments will be given and collected. A steady effort to work out all the assigned problems is essential for learning statistical methods and successful performance in this course. Brief or full homework solutions will usually be provided.
2. There is a quiz based on each homework assignment. Quizzes are open book, notes.
3. Projects are assigned every 4-5 weeks. Recently acquired statistical methods will be used to analyze various data sets. Projects should be done in SAS. A report containing the SAS code, only essential parts of the output, your comments, results and interpretation should be submitted for grading.

# About SAS

We plan to use SAS® OnDemand for Academics Enterprise Guide (free) to teach Math 675, Math 676: Statistical Methods with SAS.  Enterprise Guide is the point-click interface software integrated with SAS.  Of course, you also can edit and run SAS programming codes at EG.  We will more focus on SAS programming.  As a student in the class, you will need to register for SAS® OnDemand for Academics and then access Enterprise Guide. Here's how to get started:

1. Access the following Web site:
   http://support.sas.com/ondemand/index.html#account

2. Review the information and follow the steps at this site. Registration instruction is available at
   http://www.sas.com/govedu/edu/programs/enterprise_guide_student.pdf

3. After registration, you will receive an email from SAS with individual license number and installation key.  Following the instruction, install the software.

4. If you have additional questions about using SAS® OnDemand for Academics, see
   http://support.sas.com/ondemand  or contact me.