Statistics

STAT 578  **Topics in Statistics**  credit: 4 hours.
May be repeated if topics vary. Prerequisite: Consent of instructor.

<table>
<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>36204</td>
<td>Lecture-Discussion</td>
<td>A1</td>
<td>12:30 PM - 01:50 PM</td>
<td>TR</td>
<td>260 - Everitt Laboratory</td>
<td>Chen, X</td>
</tr>
</tbody>
</table>

High-Dimensional Prob & Stats
This course is aimed to provide a nonasymptotic theory to study functions of many independent random variables. The focus is to develop a set of probability tools that are useful for investigating the random structures in high-dimension and their applications in various problems in statistics, machine learning and theoretical computer science. Tentative topics that may depend on the audience interest and time permission include: random matrices, concentration of measure, martingale method, dimension-free functional inequalities and entropy method (Poincare, log-Sobolev, Herbst argument), transportation method (Talagrand's inequalities), isoperimetry, Markov semigroups, Gaussian process, reproducing kernel Hilbert space, suprema of random process. Selected applications such as spectrum of random matrices, sparse linear regression, matrix estimation, graphical models and multiple testing will be discussed. Restricted to Statistics Graduate Students until Dec 1, 2014.

| 45000| Lecture-Discussion    | B1      | 02:00 PM - 02:50 PM| MWF  | 205 - Gregory Hall     | Li, B       |

Spatial Data Analysis
The course will introduce the fundamental methods and principles of spatial data analysis. Both traditional approaches and new developments will be considered and discussed, and relevant R packages and functions will be illustrated. Specifically, we will emphasize on geostatistical data which will cover kriging, spatial/spatio-temporal covariance modeling, large data computation and case studies, but we will also cover the modeling of lattice data and point patterns. Restricted to Statistics Graduate Students until Dec 1, 2014.