GOAL
This course presents econometrics methods used in linear and nonlinear regression modelling. The course covers the major estimation methods - least squares, instrumental variables estimation, maximum likelihood and generalized method of moments - and their application to cross-section and panel data.

ORGANIZATION
The daily schedule is:
9.00 - 10.30: First lecture
10.30 - 10.45: Break
10.45 - 12.15: Second lecture
12.15 - 14.00: Lunch
14.00 - 16.30: Problem Set and Reading
16.30 - 17.00: Presentation
17.00 - 18.00: Review Session

COURSE OUTLINE
Day 1: Linear Regression: OLS and GLS
Ordinary least squares regression and feasible generalized least squares. Statistical inference based on both finite sample theory and asymptotic theory.

Day 2: Nonlinear Regression: MLE and NLS

Day 3: Limited dependent variable models
Binary choice models – logit and probit. Tobit models and sample selection.

Day 4: Linear panel data models
Estimation of fixed and random effects models in short panels.

Day 5: IV / GMM and brief overview of additional topics.
SUPPLEMENTAL MATERIAL

Familiarity with ordinary least squares estimation of the linear regression model and matrix algebra is necessary. To aid students who have gaps in preparation a lengthy problem set and associated brief lecture notes will be made available to course participants ahead of time. All course participants must attempt the problem set before the first day of lectures, to ensure possession of the necessary background for a course that covers a lot of material. Some lecture material will also be provided. The methods will be illustrated using Stata, and course exercises will include analysis using Stata. Ideally students will have access to Stata at the time of the course. If this is not possible then all relevant Stata output will be provided.

TEXTS

Many graduate-level texts cover most or all of the material in this course. It is assumed that you have access to one of these. I have provided a reading guide for the following four books, but there are several others that are also suitable.


COURSE READINGS

<table>
<thead>
<tr>
<th>Topic / Book</th>
<th>Cameron &amp; Trivedi</th>
<th>Davidson &amp; MacKinnon</th>
<th>Greene (5th ed.)</th>
<th>Wooldridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OLS and GLS</td>
<td>4.4-4.5</td>
<td>1.4-1.5; 3.1-3.5; 4.4-4.5</td>
<td>2.1-2.3; 5.1-5.3; 10.1-10.6</td>
<td>4.2; 7.4</td>
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<tr>
<td>2. M-estimators</td>
<td>5.2-5.5</td>
<td>–</td>
<td>16.5</td>
<td>12.1-12.3; 12.6</td>
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<tr>
<td>MLE</td>
<td>5.6-5.8</td>
<td>10.1-10.6</td>
<td>17.1-17.5</td>
<td>13.1-13.6</td>
</tr>
<tr>
<td>NLS</td>
<td>5.9</td>
<td>6.3</td>
<td>9.2</td>
<td>–</td>
</tr>
<tr>
<td>Optimization</td>
<td>10.2-10.3.1</td>
<td>6.4</td>
<td>Appx E.6.1-E.6.3</td>
<td>12.7.1</td>
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<tr>
<td>Tobit / Selection</td>
<td>16.1-16.7</td>
<td>11.6-11.7</td>
<td>22.1-22.4</td>
<td>16.1-16.5; 17.4.1</td>
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<tr>
<td>5. IV</td>
<td>4.8</td>
<td>8.1-8.3</td>
<td>5.3</td>
<td>5.1-5.2</td>
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<tr>
<td>GMM</td>
<td>6.1-6.4</td>
<td>9.1-9.5</td>
<td>18.1-118.3</td>
<td>14.1-14.2</td>
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