COURSE LECTURERS

Professor Robert Kohn
Office: John Goodsell Building Room 222
Tel: 9385-2150
Fax: 9313 6337
Email: R.Kohn@unsw.edu.au
Office Hours: Wednesdays 3:00 pm to 5:00 pm or by appointment.

Dr Jonathan Reeves
Office: Quadrangle Building
Tel: 9385 5874
Fax: 9385 6347
Email: reeves@unsw.edu.au
Office Hours: To be determined

Teaching Assistant: Quan Gan

COURSE OBJECTIVES

The course has two aims. The first is to give the student an understanding of econometric methodology and the ability to evaluate its strengths and weaknesses. The second is to give the student experience in applying the methodology by carrying out empirical work using the STATA econometric package.

The prescribed book for the course is:

I will also hand out class notes
The following general reference books will also be useful.

References:
Computing. The computing will be done with Stata. Qan Gan or Jonathan Reeves will take the lab sessions to help you get familiar with Stata. We will also go over Stata in class and the class notes will have Stata examples.

Tutorials and Lab Sessions. These will be in Quad Lab 1 from 1 to 4 pm on Mondays.

ASSESSMENT

The assessment for the course will be as follows.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Mid-Session Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>45%</td>
</tr>
</tbody>
</table>

You must pass the two exams as a whole to pass the course. Thus, you will need to get an aggregate of 35 or above out of 70 on the exams to pass the course. Your final raw grade may also be a scaled.

Assignments:
Assignment 1 will be given out in week 4 and is due 10 days later.
Assignment 2 will be given out in week 8 and is 10 days later.
Assignment 3 will be given out in week 11 and is 10 days later.

The exact date for the mid-semester exam will be announced shortly to make sure that there are no clashes. It will be either in week 7 or week 8.

Course Outline

Topic 0. Review of maths and stats
Source: Class handout and appendices A to D of Wooldridge

Topic 1. Simple linear regression model.
- Basic ideas.
- Mathematical description.
- Least squares.
- Prediction and prediction intervals.
- Residuals and fitted values.
- Standardised and studentised residuals.
- Leverage points.
- Regression diagnostics

Reference: Wooldridge chapter 2 plus class notes.
**Topic 2. Multiple linear regression.**
- Definition of model.
- Least squares
- Meaning of multiple regression.
- Regression through the origin.
- Multicollinearity.
- R-squared.
- Residual analysis and leverage.

Reference: Wooldridge chapter 3 plus class notes.

**Topic 3. Inference for Multiple linear regression.**
- T and F tests.
- Confidence intervals for parameters.

Reference: Wooldridge chapter 4 plus class notes

**Topic 4. Large sample theory for multiple linear regression.**
- Consistency.
- Central limit theorem.
- Efficiency.

Reference: Wooldridge chapter 5 plus class notes

**Topic 5. Transformation of the dependent variable in regression.**
- Basic ideas.
- Inference and prediction.
- Box-Cox transformations.

Reference: Wooldridge chapter 6 plus class notes

**Topic 6. Variable selection and model parsimony.**
- Basic ideas.
- R-squared, Adjusted R-squared, AIC and BIC.
- Stepwise regression.

Reference: Wooldridge chapter 6 plus class notes

**Topic 7. Main effects and interactions in regression.**
- Basic ideas.
- Dummy variables.
- More general interactions.

Reference: Wooldridge chapter 7 plus class notes

**Topic 8. Heteroscedasticity in Regression**
- Basic ideas.
• Tesing for heteroscedasticity.
• Modeling heteroscedasticity.

Reference: Wooldridge chapter 8 plus class notes

**Topic 9. Model Misspecification and flexible functional forms.**
• Tests for misspecification.
• Flexibly modelling the regression function.
• Unobserved covariates.
• OLS with measurement error.

Reference: Wooldridge chapter 9 plus class notes

**Topic 10. Modeling serial correlation.**
• Autocorrelations and partial autocorrelations
• Autoregressive models.
• Stationarity.
• Forecasting with autoregressive models.
• Random walk.

Reference: Wooldridge chapter 11 plus class notes

**References:** Class notes

**Topic 11. Regression analysis with time series data.**
• Regression model with lagged dependent variable.
• Regression models with autoregressive errors.
• Forecasting.
• Trend and seasonal models.

Reference: Wooldridge chapter 10 plus class notes.

**Topic 12. Modeling non-normal data**
• Binary data. Model fitting and inference.
• Maximum likelihood estimation and large sample inference.
• Regression models with binary data. Logit and probit regression.
• Large sample theory.
• Generalized linear models.

Reference: Wooldridge chapter 17 plus class notes

**Topic 13. Heteroscedastic time series models**
• Basic ideas.
• ARCH models. Model fitting and forecasting.
• GARCH models. Model fitting and forecasting.

Reference: Wooldridge chapter 17 plus class notes