ECON4201/6203
Applied Econometrics

Course Outline
Semester 1, 2016

Part A: Course-Specific Information

Students are also expected to have read and be familiar with Part B Supplement to All Course Outlines. This contains Policies on Student Responsibilities and Support, Including Special Consideration, Plagiarism and Key Dates. It also contains the BUSINESS SCHOOL PROGRAM LEARNING GOALS.
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1. **STAFF CONTACT DETAILS**

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Consultation Times – Tuesdays 2-5 pm

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Consultation Times – Tuesdays 2-5 pm

1.1 **Communications with staff**

Email correspondence on administrative matters will generally be responded to within 48 hours, except over weekends. We strongly encourage all enquiries about the course material to be made in lectures or during consultation time.

2. **COURSE DETAILS**

2.1 **Teaching Times and Locations**

Lectures run from Weeks 1-13, with no lecture in Week 9 (3 May). The time and location are: Tuesdays 6-9 pm, UNSW Business School 205.

2.2 **Units of Credit**

The course is worth 6 units of credit.  
This course is taught in parallel to both honours and postgraduate students.

2.3 **Summary of Course**

*If applied econometrics were easy, theorists would do it.”* – Angrist and Pischke, *Mostly Harmless Econometrics*

This course provides an introduction to econometrics as it is applied in macroeconomics. Emphasis is on hands-on implementation of the methods covered in the course. Topics include macroeconomic data, linear and nonlinear time series models, practical issues with likelihood-based inference for these models, computational approaches to hypothesis testing and model comparison, forecast evaluation, and structural identification. The course will equip students with the necessary knowledge to be able to undertake econometric analysis of the type commonly associated with modern macroeconomic research.

2.4 **Aims and Relationship to Other Courses**

This course is an elective subject for the Economics Honours program and the MPhil, MEc and PhD programs in Economics. The formal prerequisite is for postgraduate students is Econometric Analysis (ECON6003), and for honours students the prerequisite is covered by the entry requirements to the Honours program. I will
assume some familiarity with matrix algebra and introductory statistics and econometrics. Also, some prior knowledge in using statistical software or programming language will be handy, though all the programming relevant for this course will be covered in class. To do well in the course, you will need the aptitude to learn quickly and work hard.

Two important objectives of this course are to survey the most widely-used and useful methods for analyzing macroeconomic data and to provide insights into the practical issues and challenges in implementing these methods. However, the primary objective of the course is to stimulate interest in the application of time series econometrics to macroeconomic data, with the ultimate aim of helping students develop the necessary tools to conduct their own original research in empirical macroeconomics.

### 2.5 Student Learning Outcomes

The Course Learning Outcomes are what you should be able to do by the end of this course if you participate fully in learning activities and successfully complete the assessment items.

The Learning Outcomes in this course also help you to achieve some of the overall Program Learning Goals and Outcomes for students in the Business School. Program Learning Goals are what we want you to be or have by the time you successfully complete an undergraduate degree. You demonstrate this by achieving specific Program Learning Outcomes - what you are able to do by the end of an undergraduate degree.

For more information on Undergraduate Program Learning Goals and Outcomes, see Part B of the course outline.

The following table shows how your Course Learning Outcomes relate to the overall Program Learning Goals and Outcomes, and indicates where these are assessed:

<table>
<thead>
<tr>
<th>Program Learning Goals and Outcomes</th>
<th>Course Learning Outcomes</th>
<th>Course Assessment Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>This course helps you to achieve the following learning goals</td>
<td>On successful completion of the course, you should be able to:</td>
<td>This learning outcome will be assessed in the following items:</td>
</tr>
<tr>
<td>1</td>
<td>Knowledge</td>
<td>Understand some of the pitfalls, problems, and solutions that arise in applied econometric work. Solve problems associated with identification using macroeconomic data.</td>
</tr>
<tr>
<td>2</td>
<td>Critical thinking and problem solving</td>
<td>Critically evaluate applied econometric research. Use EViews and GAUSS effectively for a range of econometric analysis.</td>
</tr>
<tr>
<td>3a</td>
<td>Written communication</td>
<td>Construct written work which is logically and professionally presented</td>
</tr>
<tr>
<td>3b</td>
<td>Oral communication</td>
<td>Communicate ideas in a succinct and clear manner.</td>
</tr>
<tr>
<td>4</td>
<td>Teamwork</td>
<td>Work collaboratively to complete a task.</td>
</tr>
<tr>
<td>5a</td>
<td>Ethical, environmental and sustainability considerations</td>
<td>Objectively evaluate policy decisions for governments and firms based on independent, replicable analysis.</td>
</tr>
<tr>
<td>5b</td>
<td>Social and cultural awareness</td>
<td>Recall historical economic outcomes in a wide range of countries.</td>
</tr>
</tbody>
</table>
3 LEARNING AND TEACHING ACTIVITIES

3.1 Approach to Learning and Teaching in the Course
The philosophy underpinning this course and its Teaching and Learning Strategies are based on “Guidelines on Learning that Inform Teaching at UNSW”. These guidelines may be viewed at: www.guidelinesonlearning.unsw.edu.au. Specifically, the lectures, tutorials and assessment have been designed to appropriately challenge students and support the achievement of the desired learning outcomes. A climate of inquiry and dialogue is encouraged between students and teachers and among students (in and out of class). The lecturers aim to provide meaningful and timely feedback to students to improve learning outcome.

3.2 Learning Activities and Teaching Strategies
The examinable content of the course is defined by the references given in the Lecture Schedule.

Lectures
The purpose of Lectures is to provide a logical structure for the topics that make up the course; to emphasize the important concepts and methods of each topic; and to provide relevant examples to which the concepts and methods are applied.

Out-of-Class Study
While students may have preferred individual learning strategies, it is important to note that most learning will be achieved outside of class time. Lectures can only provide a structure to assist your study.

An “ideal” strategy (on which the provision of the course materials is based) might include:
- Reading of the relevant references before the lecture. This will give you a general idea of the topic area.
- Attendance at lectures. Here the context of the topic in the course and the important elements of the topic are identified. The relevance of the topic will be explained.

4 ASSESSMENT

4.1 Formal Requirements
In order to pass this course, you must:
- achieve a composite mark of at least 50 out of 100; and
- make a satisfactory attempt at ALL assessment tasks. This means attendance at 80% of lectures (9 out of 12) and a mark of at least 40% in all assessment items.
- Achieve a satisfactory level of performance in the final exam. This means a minimum mark of 40 per cent. Any student having an overall mark of 50 or more but less than 40 per cent in the final examination will be given an UF grade (unsatisfactory fail).
- (For graduate students, other rules apply with regard to satisfactory progress.)
4.2 Assessment Details

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Weighting</th>
<th>Length</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Participation</td>
<td>5%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Assignments</td>
<td>50%</td>
<td>As needed</td>
<td>Weeks 4, 8 and 11</td>
</tr>
<tr>
<td>Group presentation</td>
<td>15%</td>
<td>30 minutes</td>
<td>Weeks 12 and 13</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
<td>3 hours</td>
<td>Examination Period</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.3 Assignments and Presentations

The assignments will require the use of econometrics software. Many standard methods can be implemented in EViews, which is a “canned” econometrics package that is widely used for time series analysis. However, implementation of some of the methods requires programming. For this, we will use GAUSS, which has a free version (GAUSS lite) available. We will discuss how to access GAUSS lite in class. I will also provide guidance on programming in class. We will use MATLAB for programming in the last half of the course. MATLAB is available for download via the UNSW IT website. We will discuss MATLAB codes relevant for our course in class.

I encourage students to study together. However, for homework assignments, you must write up your own answers in your own words. Evidence of copying on written work will be treated as a serious breach of academic integrity.

In terms of the group presentations, you will form teams to present a key article in the macroeconometrics literature. Depending on the paper, you will form teams of two or three people. Also, depending on the paper, you should try to replicate and/or update some of the empirical results in the paper. I will list potential papers on the class website. Prospective groups should consult with me about which paper they plan to present. I will discuss this in more detail early on in the semester.

4.3.1 Submission Procedure for Assignments

Students must submit a hard copy of their assignment at the beginning of the class in which an assignment is due.

4.3.2 Late Submission of Assignments

Please note that late assignments will be penalized 20% of the total grade for each 24-hour period (or portion thereof) from the beginning of the class in which the assignment was due.

4.4 Final Exam Format

Due to the nature of the course material and the need to use econometric software, the final exam will be a take-home exam. The exam will be posted on the class website before the university examination period. Submission instructions and other details will be provided on the exam.
4.5 Quality Assurance

The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential and will not be related to course grades.

5 COURSE EVALUATION AND DEVELOPMENT

Each year feedback is sought from students and other stakeholders about the courses offered in the School and continual improvements are made based on this feedback. UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process is one of the ways in which student evaluative feedback is gathered. You are strongly encouraged to take part in the feedback process.

6 COURSE RESOURCES

The website for this course is on UNSW Moodle at: http://moodle.telt.unsw.edu.au

Because the methods applied in econometrics are constantly changing, there is no single textbook that is able to serve as a reference for all of the material we will discuss in the course. Instead, the lecturers will collect together some readings (listed in the course schedule below) from journal articles and chapters in textbooks. I will discuss the distribution of these readings in class.

Meanwhile, there is a recommended (but not required) textbook that provides a useful reference for the basic econometric theory needed in the course: Applied Econometric Time Series, by Walter Enders, 2009. This should be available from the campus bookstore.
# COURSE SCHEDULE

## Lecture Schedule

Lectures start in Week 1 and finish in Week 13.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1 1 March</td>
<td>Intro to Macro Data</td>
<td>Stock and Watson, Ch. 12</td>
</tr>
<tr>
<td>Week 2 8 March</td>
<td>Methodology, Basic Univariate Models: ARMA, GARCH</td>
<td>Stock and Watson, Ch. 12;</td>
</tr>
<tr>
<td>Week 3 15 March</td>
<td>Basic Multivariate Models: Single-equation, VARs, Factor Models</td>
<td>Sims (1996); Davidson and MacKinnon, Ch. 13</td>
</tr>
<tr>
<td>Week 4 22 March</td>
<td>Maximum Likelihood Estimation Assignment 1 due</td>
<td>Hamilton, Ch. 5</td>
</tr>
</tbody>
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Mid-semester break: Friday 25 March – Saturday 2 April inclusive

| Week 5 5 April | Bayesian Inference                      | Koop, Chs. 1-2; Greenberg, Ch. 7 |
| Week 6 12 April | Trends                                 | Enders, Ch. 4                    |
| Week 8 26 April | Cointegration Assignment 2 due         | Enders, Ch. 6                    |
| Week 9 3 May  | NO CLASS                               |                                 |
| Week 10 10 May | Forecasting: Loss Functions, Forecast Evaluation | Hamilton, Ch. 4; Elliott and Timmermann (2004); Diebold (2013) |
| Week 11 17 May | Structural Analysis: Granger Causality, Timing/Sign Restrictions Assignment 3 due | Diebold (1998); Granger (2004); Stock and Watson Ch. 14 and (2001), Hamilton, Ch. 11, Blanchard and Quah (1989) |
| Week 12 24 May | In-class presentations                 |                                 |
| Week 13 31 May | In-class presentations                 |                                 |