Subject Outline

Introduction

Welcome to Computational Economics class. Numerical computing has become increasingly important in virtually all areas of economic research. This subject presents a comprehensive introduction to various numerical methods that are widely used in computing economic models.

Subject Aims

The overall aim of this subject is to provide students with an important set of numerical methods and corresponding implementation skills that they will need to master in order to do advanced economic research.

Prescribed References


Other references:


*Handbook of Computational Economics*, Volume 1, 2, and 3


*Computational Macroeconomics for the Open Economy*, by Guay Lim and Paul McNelis, the MIT press, 2008

Learning Outcomes

Subject Objectives

To view the subject objectives and the generic skills you will develop through successful completion of this subject, please see the University Handbook:

To view the learning goals, generic skills and graduate attributes for your degree, please locate the University Handbook entry for your degree at:


**Generic Skills**

In this subject you will have the opportunity to develop important generic skills. These include: formulating an economic problem into a mathematical representation; choosing an appropriate numerical method for the problem at hand; implementing the computation algorithm with a software language to achieve accuracy and efficiency.

**Prerequisites**

The prerequisite knowledge for this subject includes basic economic theory, linear algebra, calculus, and some training in Matlab, a numerical computing programming language.

**Academic Staff Contact Details**

**Lecturer Contact Details**

Your lecturer for Computational Economics is Shuyun May Li.

Email: shuyunl@unimelb.edu.au

Room: 326, FBE building

Phone: 83445316

Consultation Hours: 2:00-3:00pm Tuesday, or by appointment

**Email Protocol**

Please note that we are only able to respond to student emails coming from a University email address. Please do not use personal email addresses such as Yahoo, Hotmail or even business email addresses. Emails from non-University email addresses may be filtered by the University’s spam filter, which means that we may not receive your email. All correspondence relating to this subject will only be sent to your University email address. Note that you must first activate your University email address before you can send or receive emails at that address. You can activate your email account at this link: http://accounts.unimelb.edu.au/.

While academic staff endeavor to address queries received via email, it is more appropriate to resolve substantive questions during seminars and during normal consultation hours. With
this in mind, we encourage students to attend all seminars and to familiarise themselves with the consultation hours offered by the seminar leader in this subject.

Lectures

Lecture Times

Tuesday, 10:30am-12pm, Babel-305 (Chisholm Theatre)

Thursday, 2:15-3:45pm, The Spot-3010 (Computer Lab)

Lecture Participation Requirements

Lecture participation is compulsory. Students need to inform the lecturer in advance if they are unable to attend a lecture.

Lecture Schedule

A preliminary lecture schedule is given below:

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<tr>
<th>Week</th>
<th>Topic</th>
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<td>1</td>
<td>Introduction, Solving linear equations</td>
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<td>2</td>
<td>One-dimensional optimisation</td>
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<td>3</td>
<td>Multi-dimensional optimisation</td>
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<tr>
<td>4</td>
<td>Constrained non-linear optimisation</td>
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<tr>
<td>5</td>
<td>Non-linear equations, univariate and multivariate</td>
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<td>6</td>
<td>Local and global approximation</td>
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<td>7</td>
<td>Numerical integration and differentiation</td>
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<td>8</td>
<td>Monte Carlo and Simulation methods</td>
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<td>9</td>
<td>Dynamic programming</td>
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<td>10</td>
<td>Dynamic programming</td>
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<tr>
<td>11</td>
<td>Student presentation</td>
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<tr>
<td>12</td>
<td>Student presentation</td>
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</tbody>
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Lecture Slides

Lecture slides and other study materials for each week will be posted by 4pm on Mondays. Most of the algorithms will be programmed in Matlab. Mathematica may also be used to simplify the analytical expressions.

Assessment

Assessment Overview

The assessment for this subject comprises the following: Five assignments (40 percent), student presentation (10 percent), and a final project (50 percent).

You can work on the assignments independently, or form a pair with another student to work together. For the presentation, a pair of two students needs to choose and present one article in your research field which involves numerical computing. Each presentation is 45 minutes long. The final project will be handed out in the last week of the semester and you have 3 weeks to work on it independently.

Late Submission

In order to ensure equality for all students, assignments must be completed within specified time limits. Late submissions need approval from the lecturer.

Plagiarism and Collusion

Presenting material from other sources without full acknowledgement (referred to as plagiarism) is heavily penalised. Penalties for plagiarism can include a mark of zero for the piece of assessment or a fail grade for the subject.

Plagiarism is the presentation by a student of an assignment identified as his or her own work even though it has been copied in whole or in part from another student’s work, or from any other source (eg. published books, web-based materials or periodicals), without due acknowledgement in the text.

Collusion is the presentation by a student of an assignment as his or her own work when it is, in fact, the result (in whole or in part) of unauthorised collaboration with another person or persons. Both the student presenting the assignment and the student(s) willingly supplying unauthorised material are considered participants in the act of academic misconduct.


CELT has prepared a help sheet on avoiding plagiarism, available at:

Referencing

All sources used for a written piece of assessment must be referenced. This is to acknowledge that your material is not based entirely on your own ideas, but is based, in part, on the ideas, information, and evidence of others. This is desirable as you are attending University in order to learn from others. CELT has several help sheets on citing and referencing, which are available from the CELT website.