1. **Title of the module**

ECON5008 Modelling and Computation for Economists

1. **Division or partner institution which will be responsible for management of the module**

School of Economics

Division of Human and Social Sciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 5

1. **The number of credits and the ECTS value which the module represents**

15 Credits (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn

1. **Prerequisite and co-requisite modules**

ECON3040 Principles of Economics

ECON3050 Mathematics for Economics Mode A or ECON3060 Mathematics for Economics Mode B

ECON309 Statistics for Economics

COMP3200 Introduction to Object Oriented Programming

COMP3590 Programming for Artificial Intelligence (Python Programming)

1. **The course (s) of study to which the module contributes**

Compulsory for BSc Economics with Data Science

Optional module for all Single Honours Degree Programmes in Economics.

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**

8.1 Apply numerical optimization methods to a range of economics and econometrics problems

8.2 Understand foundational methods in economic modelling and computational economics

8.3 Understand foundational methods in coding for economic analysis, standard methods for analysing large data sets

8.4 Formulate, solve and critically analyse problems in economics using a range of computational methods

8.5 Identify and develop understanding of programming languages commonly used in economics such as Python, R, and Julia

8.6 Develop and apply economic modelling skills for industry and policy analysis using industry platforms

1. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**

9.1 Analyse the logic of economic arguments

9.2 Critically evaluate economic models

9.3 Communicate economic arguments using a variety of methods

9.4 Demonstrate critical thinking and higher-level quantitative skills

1. **A synopsis of the curriculum**

This module develops students’ abilities to solve economics problems and to analyse economic data using computational techniques. It will teach students to apply numerical optimisation methods to a range of economics and econometrics problems, develop an understanding of numerical and computational methods through their practical applications, and develop an ability to assess the strengths and weaknesses of different methods for different applications. The module builds upon the Level 4 modules *Introduction to Object Orientated Programming* (COMP3200), and *Programming for Artificial Intelligence (Python programming)* (COMP3590) and will further develop students’ understanding of programming languages commonly used in economic analysis, including at least one of Python, R and/or Julia.

1. **Reading list**

The University is committed to ensuring that core reading materials are in accessible electronic format in line with the Kent Inclusive Practices.

The most up to date reading list for each module can be found on the university's [reading list pages.](https://kent.rl.talis.com/index.html)

Doing Economics (<https://www.core-econ.org/project/doing-economics/>)

Quantecon (<https://quantecon.org/>) Quantitative Economics Undergraduate Course

Quantitative Economics with Python (<https://python.quantecon.org/>)

Quantitative Economics with Julia (<https://julia.quantecon.org/>)

Additional documentation and readings based on specific topics and software to be published annually.

1. **Learning and teaching methods**

Total contact hours: 24

Private study hours: 126

Total study hours: 150

1. **Assessment methods**
   1. Main assessment methods

Coding exercises, 4x 15% (60% total)

Group project of 3000 words (30% total)

Group project presentation (15 minutes) (10%)

13.2 Reassessment methods

Individual project (3000 words) (100%)

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *8.3* | *8.4* | *8.5* | *8.6* | *9.1* | *9.2* | *9.3* | *9.4* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |
| Lecture | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** |  |
| Seminar | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Private Study | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |
| Coding exercises | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** |  |  |
| Group project | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Group project presentation |  | **x** | **x** |  |  | **x** | **x** | **x** | **x** | **x** |

1. **Inclusive module design**

The Division recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/ declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Mathematics is a global language. The module develops skills and techniques that are globally transferrable.

**DIVISIONAL OFFICE USE ONLY**

**Module record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 2019/20 | New Module | 2022/23 | All | Yes |
|  |  |  |  |  |