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# KentVision Code and title of the module

ECON6010 Machine Learning for Economists

# Division and School/Department or partner institution responsible for the module

Division of Human and Social Sciences, School of Economics

# The level of the module

Level 6

# The number of credits and the ECTS value which the module represents

15 credits (7.5 ECTS)

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

Autumn or Spring

# Delivery of the module

* 1. **Mode of study**

In person

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

Canterbury

# Prerequisite and co-requisite modules and/or any module restrictions

**Stage 1 Modules:**

WECON1000 – Kenometrics or COMP3200 – Introduction to Object Oriented Programming

**And**

COMP3590 Programming for Artificial Intelligence (Python Programming)

**Stage 2 Modules:**

ECON5800 Introduction to Econometrics (with a minimum of a pass)

ECON5810 Introduction to Time Series Econometrics (with a minimum of a pass)

This module cannot be taken if students have taken ECON5008 previously

# The course(s) of study to which the module contributes

* 1. **The module is compulsory for the following courses**

BSc Economics with Data Science

* 1. **The module is optional for the following courses**

All other Single Honours Degree Courses in Economics

# A synopsis of the curriculum

This module introduces students into the application of machine learning techniques for the analysis of real-life economic problems. The module consists of two parts. The theoretical part teaches computational and machine learning techniques developed for economists. Here the students will develop theoretical knowledge to apply them correctly in various real-life economic problems as well as correctly and critically interpret the results of machine learning analysis. The application part of the module will demonstrate how economists apply these techniques, including causal inference, using practical examples and hands-on experience.

The module builds upon the Level 4 Programming for Artificial Intelligence (COMP3590), as well as Level 5 modules. Introduction to Econometrics (ECON5800) and Introduction to Time Series Econometrics (ECON5810)

# Contact Hours

Private Study: 126

Contact Hours: 24

Total: 150

# Learning and teaching methods

This module will be delivered via lectures, seminars, and terminal classes. Lectures and seminars will mostly focus on theoretical skills, practical aspect of the module will be delivered largely in terminal classes and seminars.

# The intended subject specific learning outcomes

On successfully completing the module students will be able to:

12.1 Demonstrate confidence and flexibility in the use of industry-standard statistical software and develop understanding of programming languages commonly used in economics

12.2 Apply knowledge and understanding of machine learning and computational economics concepts used intensively in economics

12.3 Synthesise and critically compare different machine learning concepts

12.4 Demonstrate analytical skills used to formulate and consider a range of problems and issues related to machine learning

12.5 Apply numerical optimization methods to a range of machine learning concepts

12.6 Demonstrate critical understanding of statistical, graphical and numerical big data analyses in the context of economic theory and machine learning

# The intended generic learning outcomes

On successfully completing the module students will be able to:

13.1 Retrieve, review and analyse big data and information from a variety of sources

13.2 Address a problem using deductive and inductive reasoning, analyse the logic of arguments, and critically evaluate models

13.3 Apply advanced machine learning methods to support understanding of economic

13.4 Develop and apply modelling skills for industry and policy analysis using industry platforms

13.5 Communicate coherent ideas and arguments using a variety of methods

13.6 Plan work and study independently.

# Assessment Strategy

* 1. **Main assessment methods**

ICT (20%)

Final Project (5,000 words) (80%)

* 1. **How the assessment methods outlined above fit with the course assessment strategy?**

The assessment methods fully align with the course assessment strategy which focuses on a combination of lectures and a small-group system of teaching based on seminars and terminal classes. Final project is also part of the overall course-assessment pattern.

* 1. **Reassessment methods**

# 100% project Mapping of Learning Outcomes

Map of module learning outcomes (sections 12 & 13) to learning and teaching methods (section 11) and methods of assessment (section 14).

* 1. **Module learning outcomes against learning and teaching methods**

| **Module learning outcome** | 12.1 | 12.2 | 12.3 | 12.4 | 12.5 | 12.6 | 13.1 | 13.2 | 13.3 | 13.4 | 13.5 | 13.6 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Private Study** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Lecture** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** | **x** |  |  |  |
| **Terminal Class** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Seminar** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

* 1. **Module learning outcomes against assessment methods**

| **Module learning outcome** | 12.1 | 12.2 | 12.3 | 12.4 | 12.5 | 12.6 | 13.1 | 13.2 | 13.3 | 13.4 | 13.5 | 13.6 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ICT** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Final Project** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

# 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).

# 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

# University Division responsible for the course

Division of Human and Social Sciences

**MODULE RECORD**

**All revisions for this module are recorded in the table below for student and staff information.**

| **Date approved** | **New/ Material/ Major/ Minor revision** | **Start date of delivery of this version** | **Applies to new cohorts and/ or existing students (for revised modules)** | **Sections revised (if applicable)** |
| --- | --- | --- | --- | --- |
| 31/08/2023 | Major | Sept 24 | New | 5, 6, 8, 9, 20 |
|  |  |  |  |  |