

MODULE SPECIFICATION • ELECTIVE

Automatic Model Selection Methods

The purpose of this course is to provide students with an introduction to automatic model selection and its limitations and uses in practical econometric modelling. In addition, the course introduces saturation estimation techniques, and considers other approaches.

10 CREDITS	15h CONTACT HOURS	85h PRIVATE STUDY	100h TOTAL STUDY
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COURSE CONVENOR

NAME Professor Jennifer Castle and Dr Jurgen A. Doornik

OFFICE By appointment — please email to arrange a convenient time

COURSE STRUCTURE

Econ 7906 is a 10-credit course and students are expected to input approximately 100 hours of study. The total number of contact hours is 15 hours, leaving 85 hours for private study. Delivery is by lectures — 15 hours across the first three weeks of term, comprising 10 hours of lectures and 5 hours of tutorials. Optional clinics run on the last day of the course.

During private study, balance the course material (the primary source) against the recommended textbooks: think critically about how these fit into the body of knowledge, perform the exercises, complete coursework and revise. You can expect to perform well only by working consistently through the year.

MODULE PROGRAMME

LECT.	TOPIC	SESSION CONTENT
01	Theory	— Theory of reduction and model evaluation
02	Practice and algorithms	— Introduction to automatic model selection; understanding Autometrics
03	Practice of automatic model selection	— Empirical modelling with automatic model selection in action
04	Saturation methods	— Impulse indicator and other saturation methods
05	Extensions and different approaches	— Further uses of automatic model selection and alternative methods

KEY SKILLS

By the end of this course, students should have some knowledge and understanding of:

— Theoretical properties of automatic model selection

— Using and understanding results from the Autometrics algorithm in PcGive

- Have a basic understanding of the Autometrics algorithm
- Saturation estimation, such as indicator, step and trend indicator saturation
- Alternative Lasso based methods

DESIRED OUTCOMES

By the end of this course, students should be able to:

- Use automatic model selection to build econometric models
- Present, interpret and analyse the results of automatic model selection
- Use saturation estimation
- Utilise effectively PcGive and the R gets package

ASSESSMENT

WEIGHTING	100% coursework
ISSUED	End of week 6
DUE	End of week 10 — four weeks for completion
SUBMISSION	Electronically via the Moodle site for this course
FEEDBACK	Returned within 4 weeks of the deadline, as marker's notes appended to the PDF of your coursework

Marking criteria and penalties are set out in the Economics Undergraduate Handbook and the general course information paper, available via the Current Student page of the university website under Academic Regulations.

COURSE TEXT & RECOMMENDED READING

Lecture slides are made available on the course web pages, together with additional material and course announcements.

- Hendry, D. F. and Doornik, J. A. (2014). Empirical Model Discovery and Theory Evaluation. MIT Press — supplementary information at <http://www.doornik.com/Discovery>. Students should purchase a copy of this book
- For the computer labs you will also need access to XModeler or PcGive (part of OxMetrics)
- Hoover, K. D. and Perez, S. J. (1999). Data mining reconsidered: encompassing and the general-to-specific approach to specification search. *Econometrics Journal*, 2, 167–191