COURSE SYLLABUS

Doctoral course: Large sample theory, 7.5 credit points

Course code:
Reviewed by: RFB
Approved by: RFB
Valid as of:
Version: 1
Reference number: 10th October 2019

Education Cycle: Third cycle, doctoral program course
Doctoral program subject: Statistics

Purpose:

This course aims to provide theory concerning asymptotic methods of statistics and probability with applications to inference problems. Furthermore, the aim is to prepare the students to use asymptotic tools in their thesis writing. Knowledge of measure theory is not needed. However, it still is a a mathematically rigorous course and major results are proved.

Intended learning outcomes:

On completion of the course, the students will be able to:

Knowledge and understanding

1. Demonstrate a deep understanding of important theorems within large sample theory.
2. Demonstrate a deep understanding of various convergence concepts in large sample theory

Skills and abilities

3. To prove important theorems in large sample theory
4. To solve advanced problems in large sample theory

Judgement and approach

5. To apply asymptotic methods in statistical inference

Content:

This course covers most standard statistical asymptotic theory. It starts with mathematical basics such as sequences, series, limits, continuity differentiability, Taylors theorem and the notation of O_p and o_p. Then it covers weak and strong convergence of random variables in both the univariate and multivariate settings, Slutsky's theorem(s), delta method, the Lindeberg-Feller central limit theorem. It is a mathematically rigorous course and major results are proved. Many common applications in statistical inference will be discussed.

Type of Instruction/Teaching format:

The course is designed as a series of lecturers and problem-solving sessions.

Prerequisites:

Admitted to a doctoral program in statistics or a related subject of a recognized business school or university.

Examination and grades:

Course assessment consists of two elements

- Oral presentation deals with ILOs 1,2,3,4,5
- Written assignments deals with ILOs 1,2,3,4,5
- Small project related to thesis writing ILOs 1,2,5

Each of these three elements must be passed to obtain a pass in the course.

The grades given are pass or fail.

Course evaluation:

A course evaluation will be conducted at the end of the course.

Literature:

E. L. Lehman (1999, Third printing 2004). Elements of large-sample theory, Springer, New York.

Additional readings, to be assigned during the lectures.