COURSE SYLLABUS

Doctoral course: Probability theory, 7.5 credit points

Course code:
Reviewed by: RFB
Approved by: RFB
Valid as of: 2019-12-19
Version: 1
Reference number:

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

Purpose:

This course gives a solid background in and understanding of important results and methods in probability theory at an advanced level. The objective of the course is to give students a solid knowledge of important theorems within probability theory. The course should also enable them to apply advanced probability theory to building probability models in applications. Finally to be able to solve complicated probabilistic problems and explain various convergence concepts in probability

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 probability theory.
2. Demonstrate a deep understanding of various convergence concepts in probability theory

Skills and abilities

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

Judgement and approach

5. To critically apply central results in probability theory on typical probabilistic problems.

Content:

This course deals with random variables in one and several dimensions, conditional distributions, moment generating functions and characteristic functions, multivariate normal distributions, quadratic forms, order statistics, convergence criteria for random variables, the Borel-Cantelli lemmas, convergence via transforms, the central limit theorem and strong law of large numbers.

Type of Instruction/Teaching format:

The course is designed as a series of lecturers and problem-solving sessions. Grading is based on individual performance via oral presentations and written hand ins.

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

Each of these two 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:

A. Gut, An Intermediate Course in Probability Theory, Springer-Verlag Second edition.
A. Gut, Probability: A Graduate Course Series: Springer Texts in Statistics. Second edition