

# Measure Theory DI

Supervisor: Rachel Dunwell

## 1 Topic Description

Measure theory is an area of mathematics that concerns the study of the “size” of sets in an abstract setting. An understanding of the concept of measure is an essential underpinning to the theory of integrals, and this in turn is essential for a full understanding of the mathematical theories used in Economics. It is therefore highly advantageous for a student preparing for graduate studies in Economics to engage with these concepts at the undergraduate level.

In this DI students will study the first five chapters of Measure Theory by Paul R. Halmos, a classic text in the field. This study will consist of reading the sections, posing and answering questions naturally arising from the text. Emphasis will be placed on interpreting the material in a way that relates to probability theory.

## 2 Supervisor’s Role

The DI students will meet with the supervisor (Rachel Dunwell) once a week and discuss with her what they have worked on the previous week. She will then make suggestions about the focus of the students’ readings for the coming week.

## 3 End Product

During the course of the DI students will keep detailed notes on what they have read and solutions to the problems they have worked on. These notes should be the equivalent of lecture notes. The notes should be typeset with L<sup>A</sup>T<sub>E</sub>X. At the end of the course the students will give a 45 minute oral presentation of the semester’s work, to the Math and CS Department faculty.

## 4 Grading Scheme

The final grade will be made of three components: Communication (30%), scope and depth of the work (30%), and quality of worked examples (40%).