

## Mathematics 501 / 601

## Measure and Integration

(see Section 3.5C of Faculty of Science [www.ucalgary.ca/pubs/calendar/current/sc-3-5.html](http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html)  
and Course Descriptions: <http://www.ucalgary.ca/pubs/calendar/current/course-main.html>)

*Syllabus***Topics**

Measure and Integration Theorem  
Radon-Nikodym Theorem  
 $L^p$  spaces  
Product measures  
Measurable dynamics (if time permits)

*Course Outcomes*

## Overview

This course aims to widen the perspective on the concepts of measure and integration introduced through calculus and real analysis.

By a successful completion of this course, a student will be able to:

1. use the language and notion of measurable spaces and their associated integration theory;
2. build a measure over arbitrary sets, choosing appropriate subsets for its construction, and obtain measures from outer measures and from inner measures;
3. recognize the limitations of and advantages of treating sets and functions through measurability, and develop an intuitive fluency in the concepts of “almost every where” true statements;
4. deepen the scope of the connection between integration and differentiability

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