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# Chapter 1

## Measures

1.1 Introduction

1.2  $\sigma$ -algebras

1.3 Measures

1.4 Outer Measures

1.5 Lebesgue Measure

## Chapter 2

# Integration

2.1 Measurable Functions

2.2 Integration

2.3 Convergence

2.4 Tonelli-Fubini Theorem

## Chapter 3

### $L^p$ Spaces

3.1 Definition

3.2 Basic Properties

3.3  $L^2$  Space

3.4 Some Useful Inequalities

3.5 (\*)From  $L^p$  To Sobolev Space

## Chapter 4

# Fourier Analysis

- 4.1 Fourier Series
- 4.2 The Fourier Transformation on  $L^1$
- 4.3 Applications To PDE
- 4.4 (\*)Schwarz Space
- 4.5 (\*)The Fourier Transformation on  $\mathcal{S}$

# Bibliography