

## **MATH 303 – Measure Theory**

### **Draft Schedule\***

**Week 1: 8 September - History, Motivation, and Applications of Measure Theory (Chapter 1)**

Assignment: Short Moodle quiz (ungraded) for me to see what you already know and which topics need revision

**Week 2: 15 September - Abstract Measure Spaces (Chapter 2)**

Assignment: Homework 1 due 29.09

Optional assignment: Exercises on supplementary materials for additional feedback (ungraded)

**Week 3: 22 September - no class (Lundi du Jeûne)**

**Week 4: 29 September - Definition of the Integral (Chapter 3, Sections 1-2)**

Assignment: Homework 2 due 06.10

**Week 5: 6 October - Properties of the Integral (Chapter 3, Sections 3-6)**

Assignment: Homework 3 due 13.10

**Week 6: 13 October - Uniqueness of Lebesgue-Stieltjes Measures (Chapter 4, Section 1)**

Assignment: Homework 4 due 03.11

**Week 7: 27 October - Construction of Lebesgue-Stieltjes Measures (Chapter 4, Sections 2-4)**

Assignment: Homework 4 due 03.11 (continuation of previous assignment)

**Week 8: 3 November - Radon Measures (Chapter 4, Sections 5-6; Chapter 5, Sections 1-2)**

Assignment: none

**Week 9: 10 November - Riesz Representation Theorem (Chapter 5, Sections 3-5)**

Most of the class time will be reserved for reconstructing the proof of the Riesz Representation Theorem in small groups

Assignment: Homework 5 due 24.11

**Week 10: 17 November - Product Spaces (Chapter 6)**

Assignment: Continue Homework 5

**Week 11: 24 November –  $L^p$  Spaces (Chapter 7)**

Assignment: Homework on choice of topic (infinite product spaces, Haar measures, or Hausdorff dimension) due 15.12

**Week 12: 1 December - Littlewood's Principles (Chapter 8)**

Assignment: Continue mini-project

**Week 13: 8 December – Littlewood's Principles + Signed Measures (Chapter 8; Chapter 9, Section 1)**

Assignment: Continue mini-project

**Week 14: 15 December – Differentiation of Measures (Chapter 9, Section 2)**

A portion of the class time will be dedicated to discussing the mini-project topics

Assignment: none

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\* Subject to change. Last updated 12.12.2025.