

CONTENTS

	PAGE
Preface	v
Acknowledgments	vii
SECTION	
0. Prerequisites	1
CHAPTER I: SETS AND CLASSES	
1. Set inclusion	9
2. Unions and intersections	11
3. Limits, complements, and differences	16
4. Rings and algebras	19
5. Generated rings and σ -rings	22
6. Monotone classes	26
CHAPTER II: MEASURES AND OUTER MEASURES	
7. Measure on rings	30
8. Measure on intervals	32
9. Properties of measures	37
10. Outer measures	41
11. Measurable sets	44
CHAPTER III: EXTENSION OF MEASURES	
12. Properties of induced measures	49
13. Extension, completion, and approximation	54
14. Inner measures	58
15. Lebesgue measure	62
16. Non measurable sets	67
CHAPTER IV: MEASURABLE FUNCTIONS	
17. Measure spaces	73
18. Measurable functions	76

X	CONTENTS	xi
SECTION		PAGE
19. Combinations of measurable functions	80	
20. Sequences of measurable functions	84	
21. Pointwise convergence	86	
22. Convergence in measure.	90	
 CHAPTER V: INTEGRATION		
23. Integrable simple functions	95	
24. Sequences of integrable simple functions	98	
25. Integrable functions	102	
26. Sequences of integrable functions.	107	
27. Properties of integrals	112	
 CHAPTER VI: GENERAL SET FUNCTIONS		
28. Signed measures	117	
29. Hahn and Jordan decompositions	120	
30. Absolute continuity	124	
31. The Radon–Nikodym theorem	128	
32. Derivatives of signed measures	132	
 CHAPTER VII: PRODUCT SPACES		
33. Cartesian products	137	
34. Sections	141	
35. Product measures	143	
36. Fubini's theorem	145	
37. Finite dimensional product spaces	150	
38. Infinite dimensional product spaces	154	
 CHAPTER VIII: TRANSFORMATIONS AND FUNCTIONS		
39. Measurable transformations	161	
40. Measure rings	165	
41. The isomorphism theorem	171	
42. Function spaces	174	
43. Set functions and point functions.	178	
 CHAPTER IX: PROBABILITY		
44. Heuristic introduction	184	
45. Independence	191	
46. Series of independent functions	196	
SECTION		PAGE
47. The law of large numbers	201	
48. Conditional probabilities and expectations	206	
49. Measures on product spaces	211	
 CHAPTER X: LOCALLY COMPACT SPACES		
50. Topological lemmas	216	
51. Borel sets and Baire sets	219	
52. Regular measures	223	
53. Generation of Borel measures	231	
54. Regular contents'	237	
55. Classes of continuous functions	240	
56. Linear functionals	243	
 CHAPTER XI: HAAR MEASURE		
57. Full subgroups	250	
58. Existence	251	
59. Measurable groups	257	
60. Uniqueness	262	
 CHAPTER XII: MEASURE AND TOPOLOGY IN GROUPS		
61. Topology in terms of measure	266	
62. Weil topology	270	
63. Quotient groups	277	
64. The regularity of Haar measure	282	
References	291	
Bibliography	293	
List of frequently used symbols	297	
Index	299	