

Contents

PREFACE	vii
CHAPTER I. ELEMENTARY THEORY OF ORTHOGONAL POLYNOMIALS	1
1 Introduction	1
2 The moment functional and orthogonality	6
3 Existence of OPS	11
4 The fundamental recurrence formula	18
5 Zeros	26
6 Gauss quadrature	31
7 Kernel polynomials	35
8 Symmetric moment functionals	40
9 Certain related recurrence relations	45
CHAPTER II. THE REPRESENTATION THEOREM AND DISTRIBUTION	
FUNCTIONS	51
1 Introduction	51
2 Some preliminary theorems	52
3 The representation theorem	56
4 Spectral points and zeros of orthogonal polynomials	59
5 Determinacy of \mathcal{L} in the bounded case	63
6 The classical moment problems	71
CHAPTER III. CONTINUED FRACTIONS AND CHAIN SEQUENCES	77
1 Basic concepts	77
2 The fundamental recurrence formulas	80
3 A convergence theorem	82
4 Jacobi fractions and orthogonal polynomials	85
5 Chain sequences	91
6 Additional results on chain sequences	100

CHAPTER IV. THE RECURRENCE FORMULA AND PROPERTIES OF ORTHOGONAL POLYNOMIALS	107
1 Introduction	107
2 Chain sequences and orthogonal polynomials	108
3 Some spectral analysis	113
4 OPS whose zeros are dense in intervals	120
5 Preliminaries to Krein's theorem	128
6 Krein's theorem	133
CHAPTER V. SPECIAL FUNCTIONS	142
1 General remarks	142
2 The classical orthogonal polynomials	142
3 The Hahn class of orthogonal polynomials	159
4 The Meixner class of orthogonal polynomials	163
5 Other classes of orthogonal polynomials	166
CHAPTER VI. SOME SPECIFIC SYSTEMS OF ORTHOGONAL POLYNOMIALS ..	170
1 The Charlier polynomials	170
2 The Stieltjes-Wigert polynomials	172
3 The Meixner polynomials	175
4 The Bessel polynomials	181
5 The Pollaczek polynomials	184
6 Modified Lommel polynomials	187
7 Tricomi-Carlitz polynomials	190
8 OPS related to Bernoulli numbers	191
9 OPS related to Jacobi elliptic functions	193
10 The q -polynomials of Al-Salam and Carlitz	195
11 Wall polynomials	198
12 Associated Legendre polynomials	201
13 Miscellaneous OPS	203
NOTES	209
APPENDIX TABLE OF RECURRENCE FORMULAS	215
LIST OF FREQUENTLY USED SYMBOLS	223
BIBLIOGRAPHY	225
INDEX	243