

Contents

Chapter I. Tensor product	1
§ 1. Multilinear mappings	1
§ 2. Tensor product	5
§ 3. Subspaces and factor spaces	13
§ 4. Direct decompositions	15
§ 5. Linear mappings	22
§ 6. Tensor product of several vector spaces	27
§ 7. Dual spaces	30
§ 8. Finite dimensional vector spaces	35
Chapter II. Tensor product of vector spaces with additional structure.	42
§ 1. Tensor product of algebras	42
§ 2. Tensor product of G -graded vector spaces	45
§ 3. Tensor product of differential spaces	50
§ 4. Tensor product of differential algebras	57
Chapter III. Tensor algebra	61
§ 1. Tensors	61
§ 2. Tensors over a pair of dual spaces	69
§ 3. Mixed tensors	72
§ 4. Tensor algebra over an inner product space	79
Chapter IV. Skew symmetry and symmetry in the tensor algebra.	83
§ 1. Skew symmetric tensors.	83
§ 2. The factor algebra $\otimes E/N(E)$	87
§ 3. Symmetric tensors	90
§ 4. The factor algebra $\otimes E/M(E)$	92
Chapter V. Exterior algebra	95
§ 1. Skew symmetric mappings.	95
§ 2. Exterior algebra	98
§ 3. Homomorphisms, derivations and antiderivations	107
§ 4. The operator $i(a)$	116
§ 5. Exterior algebra over a direct sum	120
§ 6. Ideals in $\wedge E$	127
§ 7. Ideals and duality	137
Chapter VI. Mixed exterior algebra	141
§ 1. The algebra $\wedge (E, E^*)$	141
§ 2. The Poincaré isomorphism	149
§ 3. Applications to linear transformations	160
§ 4. Decomposable elements in $\wedge E$ and the lattice of subspaces of E	182
Chapter VII. Symmetric tensor algebra	190

§ 1. Symmetric tensor algebra	190
§ 2. Polynomial algebra.	200
Chapter VIII. Multilinear functions	205
§ 1. Multilinear functions as tensors	205
§ 2. The algebra of skew symmetric functions	212
§ 3. The algebra of symmetric functions.	219
Subject Index	225