

CONTENTS

PREFACE	VII
-------------------	-----

I. INVARIANT FORMULATION

1. Space, coordinate systems.	2
2. Transformation of coordinates	4
3. Indicical notation	7
4. Invariants, scalars, vectors	11
5. Laws of transformation.	17
6. Dot product, Riemannian space	24
7. Reciprocal contravariant base vectors in R_N	31
8. Riemannian tensors	39
9. Algebra of Riemannian tensors	44
10. Cartesian components	51
11. Vectors cross product in E_3	56
12. Triple vector product in E_3	64
13. Physical components and vector projections in E_3	67
14. Tensor equations	73

II. COVARIANT DIFFERENTIATION

15. Derivatives of base vectors	75
16. Derivatives of Riemannian tensors.	81
17. Covariant differentiation in mechanics	85
18. Covariant differentiation in E_N	97
19. Local coordinate systems in R_N	100

20. Intrinsic derivatives	104
21. The vector operator Del	109
22. Applications of the operator Del.	119
23. Riemann-Christoffel tensor	124
24. Surface geometry	127
SUMMARY	135
APPENDIX, ANSWERS	143
BIBLIOGRAPHY	149
INDEX	150

