CONTENTS

1	READER'S BACKGROUND AND PURPOSE OF BOOK	1
2	VECTOR AND MATRIX NORMS	2
3	DIAGONAL FORM OF A MATRIX UNDER ORTHOGONAL EQUIVALENCE	5
4	PROOF OF DIAGONAL-FORM THEOREM	9
5	TYPES OF COMPUTATIONAL PROBLEMS IN LINEAR ALGEBRA	12
6	TYPES OF MATRICES ENCOUNTERED IN PRACTICAL PROBLEMS	14
7	SOURCES OF COMPUTATIONAL PROBLEMS OF LINEAR ALGEBRA	16
8	CONDITION OF A LINEAR SYSTEM	20
9	GAUSSIAN ELIMINATION AND *LU* DECOMPOSITION	27

10 NEED FOR INTERCHANGING ROWS 34

11 SCALING EQUATIONS AND UNKNOWNS 37

12 THE CROUT AND DOOLITTLE VARIANTS 47

13 ITERATIVE IMPROVEMENT 49

14 COMPUTING THE DETERMINANT 55

15 NEARLY SINGULAR MATRICES 56

16 ALGOL 60 PROGRAM 58

17 FORTRAN, EXTENDED ALGOL, AND PL/I PROGRAMS 68

18 MATRIX INVERSION 77

19 AN EXAMPLE: HILBERT MATRICES 80

20 FLOATING-POINT ROUND-OFF ANALYSIS 87

21 ROUNDING ERROR IN GAUSSIAN ELIMINATION 98

22 CONVERGENCE OF ITERATIVE IMPROVEMENT 109

23 POSITIVE DEFINITE MATRICES; BAND MATRICES 114

24 ITERATIVE METHODS FOR SOLVING LINEAR SYSTEMS 120

25 NONLINEAR SYSTEMS OF EQUATIONS 132

APPENDIX 137

BIBLIOGRAPHY AND AUTHOR INDEX 138

SUBJECT INDEX 143