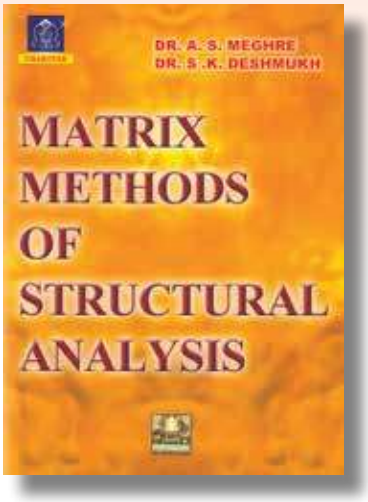


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# MATRIX METHODS OF STRUCTURAL ANALYSIS

[ THEORY, EXAMPLES AND PROGRAMS ]

By
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## ABOUT THE BOOK

This book is intended for a beginner with elementary knowledge of structural mechanics and Fortran Programming. Stiffness and flexibility methods are commonly known as matrix methods. Of these, the stiffness method using member approach is amenable to computer programming and is widely used for structural analysis.

The emphasis in the book is on explaining basic fundamentals of this approach and on developing programs. This is achieved through extremely simple style of presentation in lucid language and proceeding in stages from simple to complex structures. Unified theory with a single complex program is totally avoided. Instead, each skeletal structure is discussed in a separate chapter with simple, short and transparent program. Theory is presented in matrix notations along with clear mention of scalar components for proper understanding of the physical quantities. Illustrative solved examples explain data preparation, data file and interpretation of the results. Alternate possibilities of data preparation are mentioned and used. The information about data generation, skyline storage, variable dimensioning and frontal technique is intentionally presented separately at a later stage to help reader in modifying initial simple programs.

The treatment of flexibility and direct stiffness method is limited to introduction of elementary concepts. Transfer matrix method, plastic analysis by stiffness method and sub-structure method are included as additional topics of interest. A chapter is devoted to present an alternate view of stiffness method as a variational approach. Non-linear structural behaviour and techniques commonly adopted to evaluate non-linear response are discussed. Formulae for displacements in beams and restraining actions are included in Appendices A and B. Appendix C discusses various methods of solution of simultaneous algebraic equations. Exercises are included at the end of each chapter.

The book will be useful to undergraduate and postgraduate civil engineering students and also to those preparing for competitive examinations.

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