Introduction to finite element method /

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This text is designed for those who already know structural calculation. It starts with the simple exercise of reformulating the direct stiffness method using matrices. The aim is to allow the student to understand the enormous power and generality of the weak formulation for the approximation of strut structure problems by using a formulation which is easy to understand. The correspondence of results of the initial classical formulation with those of the FEM when using linear shape functions and Hermite polynomials allows us to tackle the general formulation of the fundamental concepts of the method more easily. Once the method and the details of its general formulation are understood (although only through its application in a specific structural type), the FEM is presented in a general way, as a procedure for obtaining approximated solutions for partial differential equations. The approaches to field problems and to linear elasticity problems are presented as examples

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