PREFACE

The analysis of complex static and dynamic problems involves in essence three stages: selection of a mathematical model, analysis of the model, and interpretation of the results. During recent years the finite element method implemented on the digital computer has been used successfully in modeling very complex problems in various areas of engineering and has significantly increased the possibilities for safe and cost-effective design. However, the efficient use of the method is only possible if the basic assumptions of the procedures employed are known, and the method can be exercised confidently on the computer.

The objective in this course is to summarize modern and effective finite element procedures for the linear analyses of static and dynamic problems. The material discussed in the lectures includes the basic finite element formulations employed, the effective implementation of these formulations in computer programs, and recommendations on the actual use of the methods in engineering practice. The course is intended for practicing engineers and scientists who want to solve problems using modern and efficient finite element methods.

Finite element procedures for the nonlinear analysis of structures are presented in the follow-up course, Finite Element Procedures for Solids and Structures – Nonlinear Analysis.

In this study guide short descriptions of the lectures and the viewgraphs used in the lecture presentations are given. Below the short description of each lecture, reference is made to the accompanying textbook for the course: Finite Element Procedures in Engineering Analysis, by K.J. Bathe, Prentice-Hall, Inc., 1982.

The textbook sections and examples, listed below the short description of each lecture, provide important reading and study material to the course.

Resource: Finite Element Procedures for Solids and Structures
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