

# Preface

This book is intended to provide an introduction to a number of important topics in engineering. The book's audience consists mainly of post-secondary electrical engineering students as well as practicing engineers interested in learning the fundamental concepts of power systems analysis and related designs. Background requirements include a basic electric circuit course and some mathematical notions from algebra and calculus.

The text material is arranged in a format which is aimed at furthering the readers' understanding by providing ample practical examples within the text to illustrate the concepts discussed. In addition, each chapter contains a section that offers additional solved problems that serve to illustrate the interrelation between the concepts discussed in the chapter from a system's point of view.

The text treats first models of the major components of modern day electric power systems. Thus, chapters three through five provide detailed discussions of synchronous machines, transmission lines, transformers and the induction motor which is a major system load component.

Chapter six deals with analysis of interconnected systems with major emphasis on load flow analysis. Chapter seven is intended to present—in a reasonable amount of detail—elements of high voltage, direct current transmission which are becoming increasingly important.

Chapter eight details analysis problems in systems with fault conditions. This is followed in Chapter nine by a treatment of system protection.

Chapter ten is devoted to transient stability problems at an introductory level. The final chapter on optimal economic operation of power systems provides a comprehensive yet simple introduction to that important area. Each of the chapters is concluded by a section of problems for drill purposes. It is assumed that the reader has access to a modest computing facility such as a programmable calculator.

I am indebted to my many students who have contributed immensely to the development of this text, in particular students at Memorial University of Newfoundland and the Technical University of Nova Scotia, who took great interest in this project. To my colleagues and friends from

