BOOKS

Automatic Process Control for Chemical Engineers. Norman H. Ceaglske. John Wiley and Sons, Inc., New York (1956). 228 pages. $6.75.

A welcome addition to the number of texts already published on the subject of automatic control is this book by Professor Ceaglske. Perhaps the only misleading statement in the entire book is the title, which would seem to limit the readers to those with a chemical engineering background. It is true that the author designed this text primarily for the chemical engineer, and more specifically for the chemical engineering undergraduate student, but the reviewer feels that this book could serve equally as well as a source of valuable information for all practicing engineers whose knowledge of automation is mainly descriptive.

Professor Ceaglske has been associated with teaching the subject of automatic control to chemical engineering students since 1936 (presently as professor of chemical engineering at the University of Minnesota) and is of the opinion that the majority of courses taught today tend to retard progress in this important field. In an attempt to correct this, he presents a clear interpretation of the developments in automatic control theory over the past 20 years. The subject matter was compiled from the undergraduate courses taught by Professor Ceaglske and therefore deals with many elementary topics; however, the graduate student or the process engineer in industry would be well advised to read this introductory text before trying to master more advanced books.

The first two chapters give a brief history of automatic control; a descriptive treatment of various instruments, processes, and control systems; and the necessary terminology. The remainder of the book is divided into five parts, each of which covers a specific phase of the mathematical analysis. The control systems considered have been restricted to those having linear response, expressed by differential equations of the first and second order only. As prerequisites the author assumes a senior standing in chemical engineering, including a working knowledge of differential equations. The Laplace transform has been used throughout the book to solve the differential equations.

Chapters 3 and 4 are devoted to the derivations of the needed equations, and the solutions to these equations, for the majority of the control systems under study. The response of these systems or parts of the systems to the three standard inputs—the step change, the ramp input, and the sinusoidal input—has also been derived. The transient analysis and the frequency response of control systems have been fully discussed and explained in Chapters 5 and 6. As a concluding section the author has dealt with the analysis and preliminary design factors of some simple control systems. To demonstrate further the theoretical principles in this text the author has included a number of illustrative examples and has also presented a list of typical problems at the end of each chapter for solution by the reader.

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