

## Book reviews

### **Process Control Modules: A Software Laboratory for Control Design**

Francis J. Doyle III, Edward P. Gatzke, Robert S. Parker (Eds.); Prentice-Hall, Englewood Cliffs, NJ, 2000, 152 pages (paperback with CD-ROM), ISBN 0-13-739897-2 (\$49.00)

This is an interesting and unusual publication. It takes the form of a workbook with CD-ROM, rather than a traditional textbook (it even has eight pages of space for the reader — or should I say user — to make their own notes and calculations). The CD carries the main feature — a dynamic plant simulator package that has been tailored for interactive use in implementing control techniques in a process environment. If you have never had the chance to operate and control a real distillation column or furnace system, then this is about as close as you can get without a hard hat.

For the simulation buffs, the software is a MATLAB/SIMULINK implementation. A reasonably good approximation to a modern DCS control screen gives you access to the means of making manual changes to valves and set points, auto/manual transfer and all the things you might expect to do from a normal operator control panel. The only added feature is that if it all goes pear shaped you can stop and re-initialise. However, “random” noise is used to provide background process and measurement noise, so you cannot expect to repeat exactly the same moves twice. I had to jump out a few times initially whilst I got used to operating the interface and all the features available but the instructions are reasonably helpful if you keep at it.

The coverage is pretty wide, ranging from simple basics, e.g. gain factor determination, up to feedforward, IMC (inverse model control), discrete, and finally, model predictive control. You might wonder how Doyle manages to pack all this into 152 pages and the answer lies in the fact that this is a workbook, which allows you to apply techniques interactively on the basis of some fairly brief overviews. Where deeper explanation is needed, the author signposts you off to consult more conventional texts separately. The result is that if you are not already into modern process control concepts, you will need access to a substantial library to get the best benefit from the exercise. Of course this really reveals the prime target readership — the student chemical engineer, undergrad or postgrad alike. The text was designed around this audience, both as a good introduction to the use of MATLAB/SIMULINK as well as to control techniques.

There are some important prerequisites to note on computer platforms. The Preface to the book says “The Process Control Modules are a set of MATLAB/SIMULINK routines which require either a full license or the Student Version of MATLAB and SIMULINK” and “The minimum recommended system configuration is a 200 MHz Pentium Pro with 32 MB RAM (or equivalent UNIX machine)”. Taking availability of these as read, the text is well graded leading incrementally from the basics to the heights. There are “fill-in-the-boxes” prompts and a host of exercise to work on. For those who want to take developments further, there are also some pointers to customising developments.

Quite a few text books now include electronic media with supporting calculations, examples, code segments, etc., but Doyle takes this a stage further and shifts the balance towards user interaction with the computer, with the text acting as a prompter. I do not think I could release my students on this until after a one semester introduction to control but for further emphasis and for more experienced practitioners to brush up with some “hands-on” practice in implementation, this is hard work but instructive, and if like me, you are already a MATLAB user, quite good fun.

T. Wilson  
*University of Nottingham*  
*SChEME, Nottingham NG7 2RD*  
*UK*

PII: S1385-8947(00)00232-1

### **Elementary Principles of Chemical Processes**

Third edition; Richard M. Felder, Ronald W. Rousseau (Eds.); John Wiley & Sons, Inc., New York, 2000, 675 pages, hardback, ISBN 0-471-53478-1 (£29.95)

Previous editions of Felder and Rousseau’s book, followed and recommended over the years in chemical engineering departments all over the world, became classic texts. The new volume keeps the same structure when addressing scientific background but updates practical matters with current problems, which offer a global view of traditional and actual applications within chemical engineering.

Mass and energy balances, the cornerstones of every chemical process, constitute the core of the book. It is important to remark that new fields where chemical engineers are developing their professional careers, such as life