:5 Differential Equations, Spring 1997

ıncy Stanton

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:xts: Boyce & DiPrima, Elementary Differential Equations and Boundary
Value Problems, Sixth Edition
Coombes, et al, Differential Equations with Maple

›mments

.fferential Equations with Maple is an excellent supplement. The
:oblems require serious use of the computer to solve problems, plot
›lutions, etc., in combination with a good understanding of the
›ncepts in order to interpret the output from Maple and sometimes in
:der to see how to use Maple on the problem. There is now a second
lition, designed for use with Maple VR 4. The authors have also
:itten Differential Equations with Mathematica.

I have never been happy with the treatment of systems of differential
quations in Boyce and DiPrima. A minor comment is that the Chapter on
ımerical methods is between the two chapters on systems. The
:eatment of repeated eigenvalues is ad hoc ($ 7.7). There is enormous
ıplication between $ 9.1P9.2 and parts of Chapter 7, with no
:knowledgment in Chapter 9 that there is duplication.

ıe students find the material on partial differential equations and
›urier series very difficult and cannot absorb it in two or three
:eks. I don't think this material belongs in the course. The whole
›ncept of Fourier series is totally new to students; it is a very deep
ıd difficult concept. Attempting to reduce it to a few cookbook
›rmulas doesn't work. The proper place to learn the material is in an
ıdergraduate course on partial differential equations, such as Math 436.

ıe chapter on higher order equations is a good place to start because
: reinforces what students have already learned. However, most
:xtbooks on ODE do not have such a chapter, since higher order
quations are easily converted into first order systems and so are
›vered (in principle) once first order linear systems have been
›vered.

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.ementary Differential Equations & Boundary Value Problems
ıapter 4 Higher Order Linear Equations
4.1 General Theory of nth Order Linear Equations
4.2 Homogeneous Equations with Constant Coefficients
4.3 The Method of Undetermined Coefficients
ıapter 6 The Laplace Transform
6.1 Definition of the Laplace Transform

. Laplace Transforms
Problem Set E: Series Solutions and Laplace Transforms
. Higher Order Equations and Systems of First Order Equations
. Qualitative Theory for Systems of Differential Equations
Problem Set F: Systems of Equations