Author: Conrad, Bruce. P.

Date of Publication: 2010.

Title: Ordinary Differential Equations: A Systems Approach.

Location: https://math.temple.edu/~conrad/ODEgreen.pdf and https://math.temple.edu/~conrad/ODEblue.pdf . Accessed 8 March 2023.

This is an author posted second edition to the text which was originally published by Prentice Hall in 2003.

The pdf is heavily peppered with very helpful hot-links to definitions, equations, statements and solutions to exercises which can be hot-linked back and forth, and other issues in the text for reference, solutions are provided. The book has everything, motivation by models, lots of exercises and solutions, theory with readable proofs. As an example in the first chapter on First-Order Differential Equations there are models, lots of attempts to reach out and touch other fields, e.g., biology and chemistry, solution strategies, e.g., separation of variables and integrating factors, numerical methods, geometric analysis, and more.

The author treats second order linear differential equations in conjunction with linear systems and also discusses nonlinear systems. Much of the material is treated through geometric approaches with emphases on such notions as phase plane, stability, equilibrium, etc.

The author says, "The text is available from either of the links below. Within the text you will find hyperlinks, which are in red. These will take you to one of the following: a numbered equation or theorem, a figure, answer to an odd-numbered exercise, or definition of a word.

"Hyperlinks in the answers to the exercises will are available to return to the exercise or to get a detailed answer. If you follow a hyperlink to a place other than an exercise answer, you will need to get back to the place you were reading.

"The purpose of linking certain words to their definitions is to remind you that it is important to know the definitions of these words, and to give you the opportunity to view the definitions as needed. To help you quickly locate the relevant definitions, I have used an alternate color for the word being defined. One version of the text uses green; the other uses blue. There are no other differences in the versions of the text. Please select the version that works best on your computer's screen."

There is an errata file https://math.temple.edu/~conrad/ODE_errata/Errata0.pdf which the author keeps up to date.