How to Use This Book

This book is written for one purpose, and one purpose only: to get you ready for the FE exam. Because it is a practice problems book, there are a few, but not many, ways to use it. Here’s how this book was designed to be used.

GET THE NCEES FE REFERENCE HANDBOOK

Get a copy of the NCEES FE Reference Handbook (NCEES Handbook). Use it as you solve the problems in this book. The NCEES Handbook is the only reference you can use during the exam, so you will want to know the sequence of the sections, what data are included, and the approximate locations of important figures and tables in the NCEES Handbook. You should also know the terminology (words and phrases) used in the NCEES Handbook to describe equations or subjects, because those are the terms you will have to look up during the exam.

The NCEES Handbook is available both in printed and PDF format. The index of the print version may help you locate an equation or other information you are looking for, but few terms are indexed thoroughly. The PDF version includes search functionality that is similar to what you’ll have available when taking the computer-based exam. In order to find something using the PDF search function, your search term will have to match the content exactly (including punctuation).

There are a few important differences between the ways the NCEES Handbook and this book present content. These differences are intentional for the purpose of maintaining clarity and following PPI’s publication policies.

- **pressure:** The NCEES Handbook primarily uses $P$ for pressure, an atypical engineering convention. This book always uses $p$ so as to differentiate it from $P$, which is reserved for power, momentum, and axial loading in related chapters.

- **velocity:** The NCEES Handbook uses $v$ and occasionally Greek $\nu$, $\nu$, for velocity. This book always uses $v$ to differentiate it from Greek upsilon, $\nu$, which represents specific volume in some topics (e.g., thermodynamics), and Greek $\nu$, $\nu$, which represents absolute viscosity and Poisson’s ratio.

- **specific volume:** The NCEES Handbook uses $v$ for specific volume. This book always uses Greek upsilon, $\nu$, a convention that most engineers will be familiar with.

- **units:** The NCEES Handbook and the FE exam generally do not emphasize the difference between pounds-force and pounds-mass. “Pounds” (“lb”) can mean either force or mass. This book always distinguishes between pounds-force (lbf) and pounds-mass (lbm).

WORK THROUGH EVERY PROBLEM

NCEES has greatly reduced the number of subjects about which you are expected to be knowledgeable and has made nothing optional. Skipping your weakest subjects is no longer a viable preparation strategy. You should study all examination knowledge areas, not just your specialty areas. That means you solve every problem in this book and skip nothing. Do not limit the number of problems you solve in hopes of finding enough problems in your areas of expertise to pass the exam.

The FE exam primarily uses SI units. Therefore, the need to work problems in both the customary U.S. and SI systems is greatly diminished. You will need to learn the SI system if you are not already familiar with it.

BE THOROUGH

Being thorough means really doing the work. Some people think they can read a problem statement, think about it for ten seconds, read the solution, and then say, “Yes, that’s what I was thinking of, and that’s what I would have done.” Sadly, these people find out too late that the human brain doesn’t learn very efficiently that way. Under pressure, they find they know and remember very little. For real learning, you’ll have to spend some time with a stubby pencil.

There are so many places where you can get messed up solving a problem. Maybe it’s in the use of your calculator, like pushing log instead of ln, or forgetting to set the angle to radians instead of degrees, and so on. Maybe it’s rusty math. What is ln$(e^x)$ anyway? How do you factor a polynomial? Maybe it’s in finding the data needed or the proper unit conversion. Maybe you’re not familiar with the SI system of units. These things take time. And you have to make the mistakes once so that you don’t make them again.
If you do decide to get your hands dirty and actually work these problems, you’ll have to decide how much reliance you place on this book. It’s tempting to turn to a solution when you get slowed down by details or stumped by the subject material. It’s tempting to want to maximize the number of problems you solve by spending as little time as possible solving them. However, you need to struggle a little bit more than that to really learn the material.

Studying a new subject is analogous to using a machete to cut a path through a dense jungle. By doing the work, you develop pathways that weren’t there before. It’s a lot different than just looking at the route on a map. You actually get nowhere by looking at a map. But cut the path once, and you’re in business until the jungle overgrowth closes in again. So do the problems—all of them. And, don’t look at the solutions until you’ve sweated a little.