

4TH EDITION

# Learning Web Design

A BEGINNER'S GUIDE TO HTML, CSS, JAVASCRIPT, AND WEB GRAPHICS

Jennifer Niederst Robbins

Whether you're a beginner or bringing your skills up to date, this book gives you a solid footing in modern web production. I teach each topic visually at a pleasant pace, with frequent exercises to let you try out new skills. Reading it feels like sitting in my classroom! —Jennifer Robbins



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# Learning Web Design, 4th Edition

## A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics

Do you want to build web pages, but have no previous experience? This friendly guide is the perfect place to start. You'll begin at square one, learning how the Web and web pages work, and then steadily build from there. By the end of the book, you'll have the skills to create a simple site with multi-column pages that adapt for mobile devices.

Learn how to use the latest techniques, best practices, and current web standards—including HTML5 and CSS3. Each chapter provides exercises to help you learn various techniques, and short quizzes to make sure you understand key concepts.

This thoroughly revised edition is ideal for students and professionals of all backgrounds and skill levels, whether you're a beginner or brushing up on existing skills.

- Build HTML pages with text, links, images, tables, and forms
- Use style sheets (CSS) for colors, backgrounds, formatting text, page layout, and even simple animation effects
- Learn about the new HTML5 elements, APIs, and CSS3 properties that are changing what you can do with web pages
- Make your pages display well on mobile devices by creating a responsive web design
- Learn how JavaScript works—and why the language is so important in web design
- Create and optimize web graphics so they'll download as quickly as possible

### About the author

Jennifer Niederst Robbins has two decades of web design experience, and designed the first commercial website, O'Reilly's Global Network Navigator (GNN), in 1993. She's the author of *O'Reilly's Web Design in a Nutshell*, and has taught web design at the Massachusetts College of Art in Boston and Johnson and Wales University in Providence, Rhode Island.

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Fourth Edition

A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics

**Jennifer Niederst Robbins**

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# Learning Web Design, Fourth Edition

by Jennifer Niederst Robbins

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# PREFACE

Hello and welcome to the fourth edition of *Learning Web Design*.

So much has happened since the previous edition! Just when it looked like things were beginning to settle down with the adoption of web standards by the browser creators and the development community, along comes the “Visible Web” to shake things up again. With the introduction of smart phones and tablets, the Web is finding its way onto small screens and into the go-anywhere, where-it-ever-is world we’ve never experienced before. This has introduced some rigorous challenges for web designers and programming as we scramble to find ways to make the experience of using our sites pleasing, useful, and so how they might be accessed.

As I write, many of these challenges, such as how to deliver the right image to the right device, are still being debated. It’s an incredibly busy time for web design. If it’s experimentation and collaboration in all ways, it reminds me of the Wild West days of the Web: here in 1993 when I started my web design career. So much to figure out! So many possibilities! And to be honest, it’s also a rocky time, and there’s moving target technologies and requirements down in the books. To that end, I’ve done my best to point out the topics that are critical and provide pointers to online resources to bring you up to date.

There are also two new standards: HTML5 (the first major revision of Hypertext Markup Language) and CSS3 (Cascading Style Sheets, level 3) available to us now, but which were not in the last time I wrote this book. The HTML5 section of this book now reflects the current HTML5 standard. However the parts of the developing CSS3 standard that are already in prime time, including a new chapter on building motion and interactivity with Transitions and Transformations. Over the years, I’ve found a lot of ways to do something in a more efficient way than even a few years ago.

Finally, because JavaScript has become such a significant part of web development, this new edition includes two chapters introducing JavaScript, syntax and a few of its uses. I’m no JavaScript expert, but I was very lucky to find someone who is. The JavaScript chapters were written by Vee “White”

## THE COMPANION WEBSITE

Be sure to visit the companion website for this book at [learningwebdesign.com](http://learningwebdesign.com). It features materials for the exercises, downloadable articles, lists of links from the book, book references, and other good stuff.

Marquis, who is a designer and developer at Filament Group, a member of the jQuery Mobile team, and the Technical Editor at *A List Apart*.

As in the first three editions, this book addresses the specific needs and concerns of beginners of all backgrounds, including seasoned graphic designers, programmers looking for a more creative outlet, office assistants, recent college graduates, work-at-home moms, and anyone else wanting to learn how to design websites. I've done my best to put the experience of sitting in my beginner web design class into a book, with exercises and tests along the way, so you get hands-on experience and can check your progress.

Whether you are reading this book on your own or using it as a companion to a web design course, I hope it gives you a good head start and that you have fun in the process.

## How This Book Is Organized

*Learning Web Design, Fourth Edition* is divided into five parts, each dealing with an important aspect of web development.

### Part I: Getting Started

Part I lays a foundation for everything that follows in the book. I start off with some important general information about the web design environment, including the various roles you might play, the technologies you might learn, and tools that are available to you. You'll get your feet wet right away with HTML and CSS and learn how the Web and web pages generally work. I'll also introduce you to some Big Concepts that get you thinking the way modern web designers think about their craft.

### Part II: HTML for Structure

The chapters in Part II cover the nitty-gritty of every element and attribute available to give content semantic structure, including the new elements introduced in HTML5. We'll cover the markup for text, links, images, tables, and forms. Part II closes out with an in-depth discussion of HTML5 and how it differs from previous standards.

### Part III: CSS for Presentation

In the course of Part III, you'll go from learning the basics of using Cascading Style Sheets for changing the presentation of text to creating multicolumn layouts and even adding time-based animation and interactivity to the page. It also addresses common CSS techniques, including how to create a page using Responsive Web Design.

### Part IV: JavaScript for Behaviors

Mat Marquis starts Part IV out with a rundown of JavaScript syntax so you can tell a variable from a function. You'll also get to know some ways that JavaScript is used, including DOM Scripting, and existing

### Typographical Conventions Used In This Book

The following typographical conventions are used in this book:

#### *Italic*

Used to indicate URLs, email addresses, filenames, and directory names, as well as for emphasis.

#### Colored roman text

Used for special terms that are being defined and for cross-references.

#### Constant width

Used to indicate code examples and keyboard commands.

#### Colored constant width

Used for emphasis in code examples.

#### *Constant width italic*

Used to indicate placeholders for attribute and style sheet property values.

JavaScript tools such as polyfills and libraries that let you put JavaScript to use quickly, even if you aren't quite ready to write your own code from scratch.

### Part V: Creating Web Graphics

Part V introduces the various file formats that are appropriate for the Web and describes how to optimize them to make their file size as small as possible.

## Acknowledgments

I want to thank my editor, Simon St. Laurent, with whom I've had a good run of collaborative projects and I look forward to more. Thanks also go to my contributor, Mat Marquis ([matmarquis.com](http://matmarquis.com)), for making JavaScript entertaining and for maintaining good spirits while collaborating with a control freak.

Many smart and lovely people had my back on this edition. I want to thank my primary technical reviewers, Aaron Gustafson ([easy-designs.net](http://easy-designs.net)), Joel Marsh ([thehipperement.com](http://thehipperement.com)), and Matt Menzer, for taking so much time out of their schedules to make sure the details in the chapters were spot on. Thanks also go to the following folks for their "surgical strike" reviews: Anthony Calzadilla, Danny Chapman, Matt Haughey, Gerald Lewis, Jason Pamental, and Stephanie Rieger.

I feel fortunate to know so many of the leaders in this field whose books, articles, presentations, slide decks, and personal contact were the fuel that kept me going. I couldn't have done it without the help of these geniuses (in alphabetical order): Dan Cederholm, Josh Clark, Andy Clarke, Chris Coyier, Brad Frost, Lyza Gardner, Jason Grigsby, Stephen Hay, Scott Jehl, Scott Jenson, Tim Kadlec, Jeremy Keith, Sanders Kleinfeld, Peter-Paul Koch, Bruce Lawson, Ethan Marcotte, Eric Meyer, Karen McGrane, Shelley Powers, Bryan Rieger, Stephanie Rieger, Remy Sharp, Luke Wroblewski, and Jeffrey Zeldman.

It takes a village to make a book, and I'd like to extend my appreciation to the contributions of Melanie Yarbrough (production editor and proofreader), Genevieve d'Entremont (copy editor), Rebecca Demarest (figure production), Newgen (page layout), Ellen Troutmen Zeig (index), Randy Comer (book cover design), and Ron Bilodeau (book interior design).

Finally, I'd like to thank Edie Freedman (best boss ever) for her patience while this book sucked me into a vortex. And to my dearest darlings, Jeff and Arlo, I'm happy to finally say, "I'm back."

## About the Author

**Jennifer Robbins** began designing for the Web in 1993 as the graphic designer for Global Network Navigator, the first commercial website. In addition to this book, she is the author of *Web Design in a Nutshell* and *HTML5 Pocket Reference* (which is also available as an iOS app), both published by O'Reilly. In the past, Jennifer has spoken at many conferences, including Seybold and South By Southwest, and has taught beginning web design at Johnson and Wales University in Providence, RI. She is currently a digital product designer for O'Reilly Media, where she is interested in information architecture, interaction design, and making websites, apps, and ebooks pleasant to use. When not on the clock, Jennifer enjoys making things, indie rock, cooking, and being a Mom.

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# GETTING STARTED

PART

I

## IN THIS PART

Chapter 1

*Where Do I Start?*

Chapter 2

*How the Web Works*

Chapter 3

*Some Big Concepts You  
Need to Know*



# WHERE DO I START?

The Web has been around for more than 36 years now, experiencing explosive early expansion, an exponential-driven (at an immoderate criteria) decline, and a gradual reevaluation along the way. One thing is certain: The Web as a communication and commercial medium is here to stay. Not only that, it has found its way onto devices such as smart phones, tablets, TVs, and more. There have never been more opportunities to put web design to work.

Through my experience teaching web design courses and workshops, I've had the opportunity to meet people of all backgrounds who are interested in learning how to build web pages. Allow me to introduce you to just a few:

*"I've been a print designer for 17 years, and now I'm feeling pressure to provide web design services."*

*"I work as a secretary in a small office. My boss has asked me to put together a small internal website to share company information among employees."*

*"I've been a programmer for years, but I want to try my hand at design. I feel like the Web is a good opportunity to explore new skills."*

*"I am essential and I need to know how to get a copy of my paintings and solutions online."*

*"I tinkered with web pages at high school and I think it might be something I'd like to do for a living."*

Whatever the motivation, the first question is always the same: "Where can I start?" It may seem like there are mountains of stuff to learn, and it's not easy to know where to jump in. But you have to start somewhere.

This chapter attempts to put the learning curve in perspective by answering the most common questions I get asked by people ready to make the leap. It provides an introduction to the disciplines, technologies, and tools associated with web design.

## IN THIS CHAPTER

Where do I start?

What does a web designer do?

What languages do I need to learn?

What software and equipment do I need to buy?

## Where Do I Start?

Your particular starting point will no doubt depend on your background and goals. However, a good first step for everyone is to get a basic understanding of how the Web and web pages work. This book will give you that foundation. Once you learn the fundamentals, there are plenty of resources on the Web and in bookstores for you to further your learning in specific areas.

There are many levels of involvement in web design, from building a small site for yourself to making it a full-blown career. You may enjoy being a full-service website developer or just specializing in one skill. There are a lot of ways you can go.

If your involvement in web design is purely at the hobbyist level, or if you have just one or two web projects you'd like to publish, you may find that a combination of personal research (like reading this book), taking advantage of available templates, and perhaps even investing in a visual web design tool such as Adobe Dreamweaver may be all you need to accomplish the task at hand. Many Continuing Education programs offer introductory courses to web design and production.

If you are interested in pursuing web design or production as a career, you'll need to bring your skills up to a professional level. Employers may not require a web design degree, but they will expect to see working sample sites that demonstrate your skills and experience. These sites can be the result of class assignments, personal projects, or a simple site for a small business or organization. What's important is that they look professional and have well-written, clean HTML, style sheets, and possibly scripts behind the scenes. Getting an entry-level job and working as part of a team is a great way to learn how larger sites are constructed and can help you decide which aspects of web design you would like to pursue.

### I Just Want a Blog!

You don't necessarily need to become a web designer to start publishing your words and pictures on the Web. You can start your own "blog" or personal journal site using one of the free or inexpensive blog hosting services. These services provide templates that generally spare you the need to learn HTML (although it still doesn't hurt). These are some of the most popular as of this writing:

- WordPress ([www.wordpress.com](http://www.wordpress.com))
- Blogger ([www.blogger.com](http://www.blogger.com))
- Tumblr ([www.tumblr.com](http://www.tumblr.com))

Another drag-n-drop site design and hosting service that goes beyond the blog is Squarespace ([www.squarespace.com](http://www.squarespace.com)).

### AT A GLANCE

The term "web design" has come to encompass a number of disciplines, including:

- Visual (graphic) design
- User interface and experience design
- Web document and style sheet production
- Scripting and programming
- Content strategy
- Multimedia

## What Does a Web Designer Do?

Over the years, the term "web design" has become a catchall for a process that encompasses a number of different disciplines, from user experience design, to document markup, to serious programming. This section describes some of the most common roles.

If you are designing a small website on your own, you will need to wear many hats. The good news is that you probably won't notice. Consider that the day-to-day upkeep of your household requires you to be part-time chef, housecleaner, accountant, diplomat, gardener, and construction worker—but to you it's just the stuff you do around the house. In the same way, as a solo web designer, you may be a part-time graphic designer, writer, HTML author, and information architect, but to you, it'll just feel like "making web pages." Nothing to worry about.

There are also specialists out there whom you can hire to fill in the skills you don't have. For example, I have been creating websites since 1993 and I still hire programmers and multimedia developers when my clients require interactive features. That allows me to focus on the parts I do well (in my case, it's the content organization, interface, and visual design).

Large-scale websites are almost always created by a team of people, numbering from a handful to hundreds. In this scenario, each member of the team focuses on one facet of the site-building process. If that is the case, you may be able to simply adapt your current set of skills (writing, Photoshop, programming, etc.) and interests to the new medium.

I've divided the myriad roles and responsibilities typically covered under the umbrella term "web design" into four very broad categories: design, development, content strategy, and multimedia.

## Design

Ah, design! It sounds fairly straightforward, but even this simple requirement has been divided into a number of specializations when it comes to creating sites. Here are a few of the new job descriptions related to designing a site, but bear in mind that the disciplines often overlap and that the person calling herself the "Designer" often is responsible for more than one (if not all) of these responsibilities.

### User Experience, Interaction, and User Interface design

Often, when we think of design, we think about how something looks. On the Web, the first matter of business is designing how the site *works*. Before picking colors and fonts, it is important to identify the site's goals, how it will be used, and how visitors move through it. These tasks fall under the disciplines of [Interaction Design \(IXD\)](#), [User Interface \(UI\) design](#), and [User Experience \(UX\) design](#). There is a lot of overlap between these responsibilities, and it is not uncommon for one person or team to handle all three.

The goal of the [Interaction Designer](#) is to make the site as easy, efficient, and delightful to use as possible. Closely related to interaction design is [User Interface design](#), which tends to be more narrowly focused on the functional organization of the page as well as the specific tools (buttons, links, menus, and so on) that users use to navigate content or accomplish tasks.

A more recent job title in the web design realm is the [User Experience Designer](#). The UX designer takes a more holistic view—ensuring the entire experience with the site is favorable. UX design is based on a solid understanding of users and their needs based on observations and interviews. According to Donald Norman (who coined the term), user experience design includes "all aspects of the user's interaction with the product: how it is perceived, learned, and used." For a website or application, that includes

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*If you are not interested in becoming a jack-of-all-trades solo web designer, you may choose to specialize and work as part of a team or as a freelance contractor.*

---

the visual design, the user interface, the quality and message of the content, and even overall site performance. The experience must be in line with the organization’s brand and business goals in order to be successful.

Some of the documents an IxD, UI, or UX designer might produce include:

### User research and testing reports

Understanding the needs, desires, and limitations of users is central to the success of the design of the site or web application. This approach of designing around the user’s needs is referred to as **User Centered Design (UCD)**, and it is central to contemporary design. Site designs often start with user research, including interviews and observations, in order to gain a better understanding of how the site can solve problems or how it will be used. It is typical for designers to do a round of user testing at each phase of the design process to ensure the usability of their designs. If users are having a hard time figuring out where to find content or how to move to the next step in a process, then it’s back to the drawing board.

### Wireframe diagrams

A wireframe diagram shows the structure of a web page using only outlines for each content type and widget (Figure 1-1). The purpose of a wireframe diagram is to indicate how the screen real estate is divided and indicate where functionality and content such as navigation, search boxes, form elements, and so on, are placed, without any decoration or graphic design. They are usually annotated with instructions for how things should work so the development team knows what to build.

### Site diagram

A site diagram indicates the structure of the site as a whole and how individual pages relate to one another. Figure 1-2 shows a very simple site diagram. Some site diagrams fill entire walls!

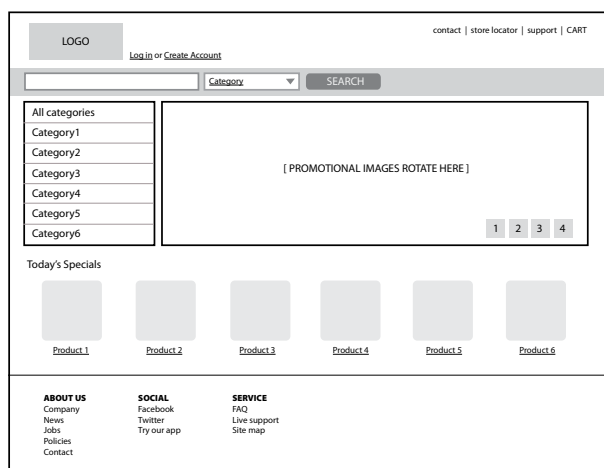


Figure 1-1. Wireframe diagram.

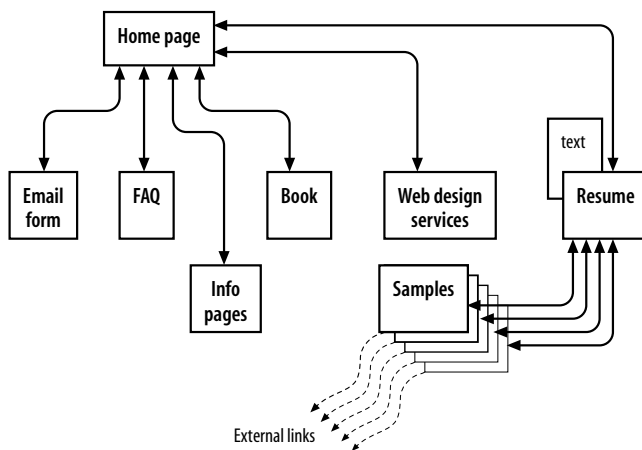


Figure 1-2. A simple site diagram.



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