



# CS3220 Web and Internet Programming

## Introduction to Bootstrap

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# The Need for Responsive Web Design

- ◆ It's important that a website looks good on both desktop computers and mobile devices
- ◆ However, it's undesirable to create and maintain separate designs for different devices

# Responsive Web Design (RWD)

- ◆ Designing websites that can automatically adapt to different viewing environments
- ◆ Example: [The Boston Globe](#)

# UI Frameworks

- ◆ A.K.A. CSS Frameworks, though most of them also involve JavaScript
- ◆ Bootstrap is the most widely used by a large margin

# About Bootstrap

- ◆ Originally developed by Twitter
- ◆ "Responsive, mobile-first"
- ◆ Most popular web UI framework in the world
- ◆ <https://getbootstrap.com/>

# Adding Bootstrap 4 to HTML

- ◆ Require HTML 5
- ◆ Link to Bootstrap stylesheet
- ◆ Some components also need JavaScript libraries
- ◆ Starter Template at <https://getbootstrap.com/docs/4.5/getting-started/introduction/>

# Bootstrap Example

- ◆ Bootstrap provides lots of pre-created styles and utilities in the form of CSS classes
- ◆ Learning Bootstrap is mostly about learning these CSS classes

# Overview

- ◆ **Layout**
- ◆ **Components:** various pre-built UI components like buttons
- ◆ **Content:** structures that contains content like tables
- ◆ **Utilities:** convenient and/or responsive ways to control various element properties like border, spacing, and visibility
- ◆ **Icons:** use external icon sets



# Responsive Containers

- ◆ `.container`

- Fixed-width (`max-width` changes based on screen size)

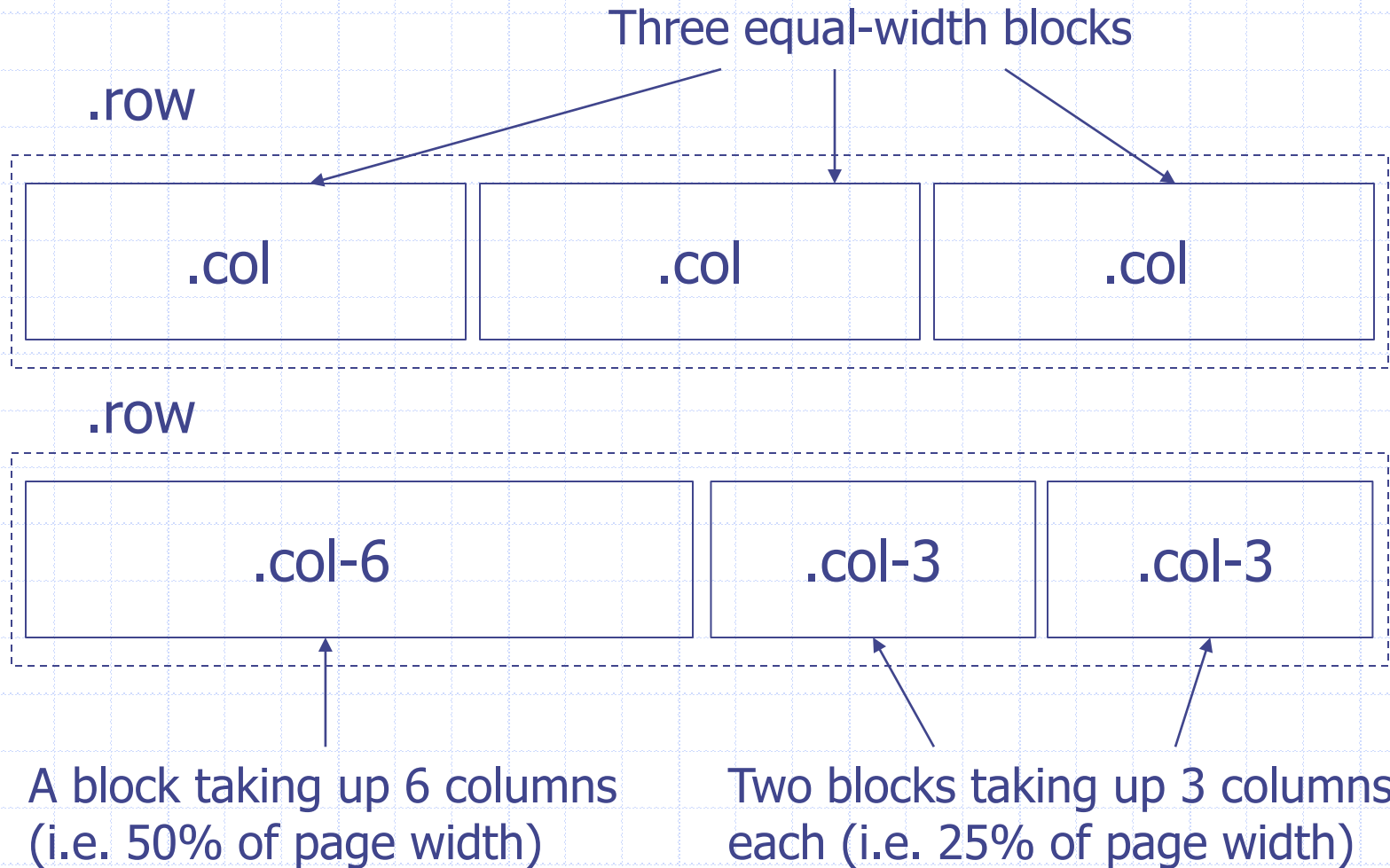
- ◆ `.container-fluid`

- Full-width

# Grid

- ◆ Bootstrap layout is based on a grid system with rows (`.row`) and columns (`.col`, `.col-<n>`, and `.col-<device>-<n>`)
- ◆ Each row has a grid of 12 columns

# Grid Example



# Make It Responsive ...

◆ 5 device categories (*responsive breakpoints*) based on screen width

- Extra small → Phone (portrait)
- Small (sm) → Phone (landscape)
- Medium (md) → Tablet
- Large (lg) → Desktop
- Extra (large) → Desktop

# ... Make It Response

- ◆ `col-<n>`: n-column wide when the device is extra small *or above*, e.g.  
`col-6`
- ◆ `col-<device>-<n>`: n-column wide when the device is `<device>` *or above*, e.g. `col-md-6`
- ◆ Combine them together, e.g. `col-12`  
`col-md-4 col-lg-3`

# My Globe Example

◆ <https://csns.calstatela.edu/download?fileId=6965826>

- Layout
- Header and menu
- Border and spacing

# Component: Navbar ...

## ◆ <nav>

- .navbar
- .navbar-expand-<device>

## ◆ Brand

- Link, image, and/or text
- .navbar-brand

# ... Component: Navbar

## ◆ Menu

- `<ul>` with `.navbar-nav`
- `<li>` with `.nav-item`
- `<a>` with `.nav-link`

## ◆ Menu button and collapse behavior

- `<button>` with `.navbar-toggler` and an icon
- A collapsible element with `.collapse` and `.navbar-collapse`



# data-\* Attributes

- ◆ User-defined attributes in HTML 5
- ◆ Usually used to add additional data to an element which can be used by JavaScript code

# aria-\* Attributes

- ◆ Accessible Rich Internet Applications
- ◆ A set of attributes that define ways to make web content and web applications more accessible to people with disabilities
- ◆ More details at <https://developer.mozilla.org/en-US/docs/Web/Accessibility/ARIA>

# Forms and Tables

## ◆ Forms –

<https://getbootstrap.com/docs/4.5/components/forms/>

## ◆ Tables –

<https://getbootstrap.com/docs/4.5/content/tables/>

# About Bootstrap Utilities

- ◆ Q: Why not just use plain CSS?
- ◆ A: *Convenience, Responsiveness, and Theme*

# Utilities: Border

◆ Border:

<https://getbootstrap.com/docs/4.5/utilities/borders/>

# Utilities: Margin and Padding

`{property} {sides} - {size}`

or

`{property} {sides} - {breakpoint} - {size}`

◆ See

<https://getbootstrap.com/docs/4.5/utilities/spacing/>

# Color and Color Theme

- ◆ <https://getbootstrap.com/docs/4.5/utilities/colors/>
- ◆ More themes at <https://bootswatch.com/>
  - Simply replace the Bootstrap CSS link with the CSS link of the selected theme
  - <https://www.bootstrapcdn.com/bootswatch/>

# Utility: Display

- ◆ <https://getbootstrap.com/docs/4.5/utilities/display/>
- ◆ `.d-<value>, .d-<device>-<value>`
- ◆ Value could be `none`, `inline`, `block`, and so on



# Show/Hide Elements Responsively

- ◆ `d-none`: hide on extra small *or above* (i.e. always hide)
- ◆ `d-none d-md-block`: display as a block element on medium *or above*; hide otherwise
- ◆ `d-none d-md-block d-lg-none`:  
??

# Icon Sets

- ◆ Bootstrap Icons -  
<https://icons.getbootstrap.com/>
- ◆ Material Icons -  
<https://material.io/resources/icons/>
- ◆ Font Awesome Icons -  
<https://fontawesome.com/>

# Add Font Awesome CSS

- ◆ Newer versions at <https://fontawesome.com/start>
  - Require registration or host it yourself
- ◆ Older versions on CDN
  - <https://cdnjs.com/libraries/font-awesome>
  - <https://www.bootstrapcdn.com/fontaweso me/>

# Use Font Awesome Icons

- ◆ Search <https://fontawesome.com/> for icons you want to use
  - The greyed-out ones are not free
- ◆ Click on "Start Using This Icon" and copy & paste the HTML code
- ◆ Read the [documentation](#) for more information