Introduction To Web Programming I

(CSC 211)

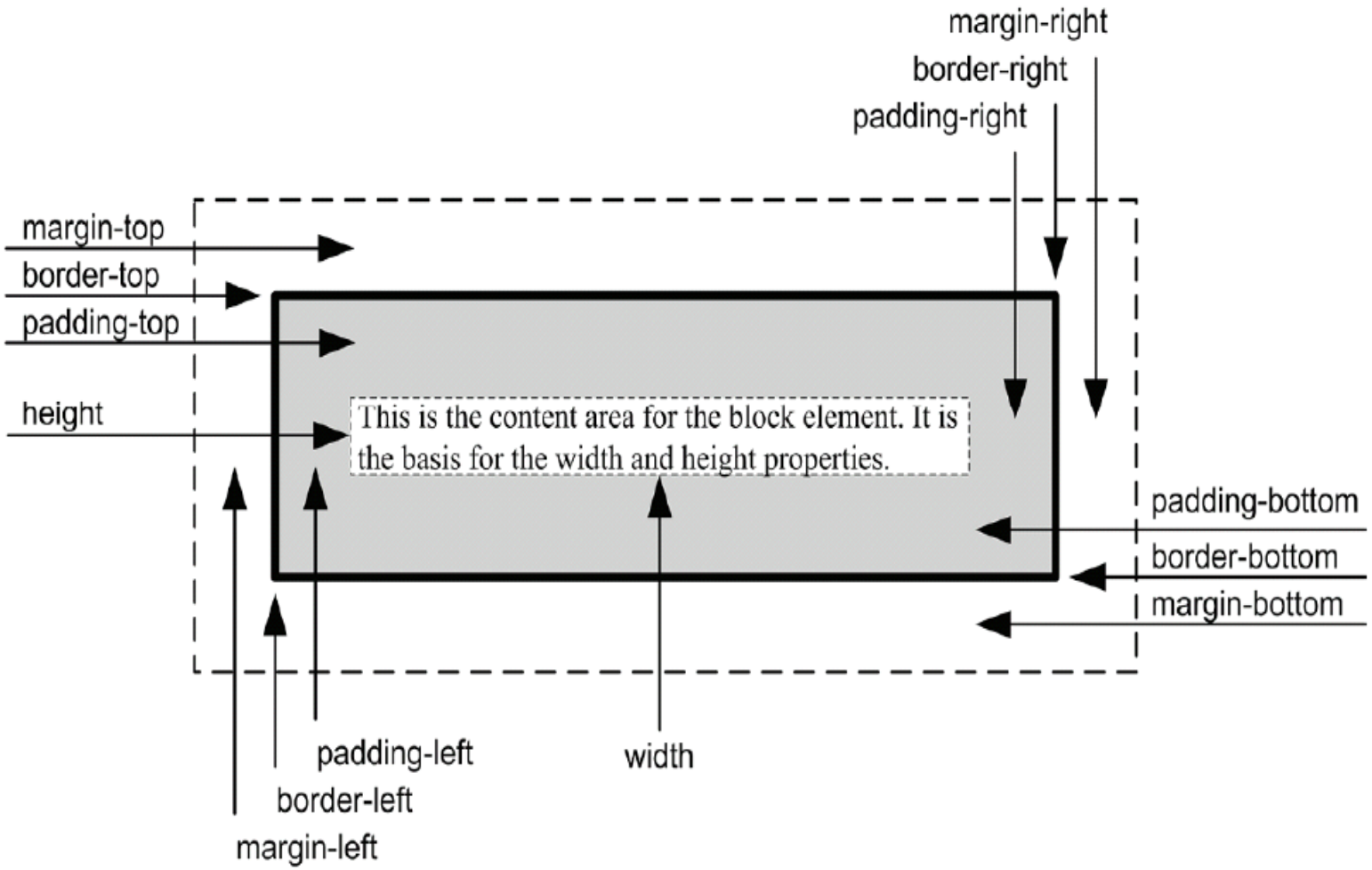
Lecture Note 5

Box Model

27th January, 2020

How to use the CSS box model for spacing, borders and backgrounds

- CSS Box Model
- The CSS box model lets you work with the boxes that a browser places around each block element as well as some inline elements. This lets you add formatting such as margins, padding, and borders.
- By default, the box for a block element is as wide as the block that contains it and as tall as it needs to be based on its content.
- You can use the height and width properties to specify the size of the content area for a block element explicitly.
- You can use other properties to control the margins,, and padding, and borders for block element. Then, these properties are added to the height and width o f the content area to determine the height and width of the box.


margin-right
border-right
padding-right
margin-top
border-top
padding-top
height
This is the content area for the block element. It is the basis for the width and height properties.
padding-bottom
border-bottom
margin-bottom
padding-left
width
border-left
margin-left

- The formula for calculating the height of a box

  top margin + top border + top padding +

  height +

  bottom padding + bottom border + bottom margin

- The formula for calculating the width of a box

  left margin + left border + left padding +

  Width +

  right padding + right border + right margin

- The HTML for a page that uses the box model

```
<body>
    <main>
        <h1>San Joaquin Valley Town Hall</h1>
        <p>Welcome to San Joaquin Valley Town Hall.
        We have some fascinating speakers for you this season!</p>
    </main>
</body>
```

- The CSS for the page

```
body {
        border: 3px dotted black;
        margin: 10px;
}
main {
        border: 2px solid black;
        width: 500px;
        margin: 20px; /* all four sides*/
        padding: 10px; /* all four sides*/
}
h1, p {
        border: 1px dashed black;
        padding: 10px; /* all four sides*/
}
```

```
h1 {
    margin: .5em 0 .25em;
    /*.5em top, 0 right and left, .25em bottom*/
    padding-left: 15px;
}
p {
    margin: 0;
    padding-left: 15px;
}
```

How to size and space elements

- How to set heights and widths
  - If you specify a percent for the width property, the width of the content area for the block element is based on the width of the block that contains it, called the containing block. In that case, the width of the containing block must be specified explicitly.
  - If you specify a percent for the height property, the height of the content are for the block element is based on the height of the containing block. In that case, the height of the containing block must be specified explicitly. Otherwise, "auto" is substituted for the percent.
  - The min-width, max-width, min-height, and max-height properties are typically used to accommodate a change in font size.

Properties for setting heights and widths

- **width** - A relative or absolute value that specifies the width of the content area for a block element. You can also specify auto if you want the width of the box calculated for you based on the width of its containing block. This is the default.
- **height** - A relative or absolute value that specifies the height of the content area for a block element. You can also specify auto if you want the height of the area calculated for you based on its content. This is the default.
- **min-width** - A relative or absolute value that specifies the minimum width of the content area for a block element. The area will always be at least this wide regardless of its content.
- **max-width** - A relative or absolute value that specifies the maximum width of the content area for a block element. You can also specify none to indicate that there is no maximum width.
- **min-height** - A relative or absolute value that specifies the minimum height of the content area for a block element. The area will always be at least this tall regardless of its content.
- **max-height** - A relative or absolute value that specifies the maximum height of the content area for a block element. You can also specify none to indicate that there is no maximum height.

- How to set the width of the content area

  width: 450px; /* an absolute width */

  width: 75%; /* a relative width */

  width: auto; /* width based on its containing block (the default) */

- How to set the height of the content area

  height: 125px;

  height: 50%;

  height: auto; /* height based on its content (the default) */

- How to set the minimum and maximum width and height

  min-width: 450px;

  min-width: 600px;

  min-width: 120px;

  min-width: 160px;

How to set margins

- If you specify a bottom margin for one element and a top margin for the element that follows in the HTML, the margins are collapsed, which means that only the larger margins is applied.
- You typically use the "auto" keyword to center an element in its containing block. To do that, you must also specify the width of the element.
- Because different browsers have different default margins for block elements, you often need to set these margins explicitly.
- Properties for setting margins
  - **margin-top** - A relative or absolute value that defines the space between the top border of an element and the top of the containing block or the bottom of the element above it.
  - **margin-right** - A relative or absolute value that defines the space between the right border of an element and the right side of the containing block or the left side of the element to its right.

- **margin-left** - A relative or absolute value that defines the space between the left border of an element and the left side of the containing block or the right side of the element to its left.
- **margin** - One to four relative or absolute values that specify the size of the margins for a box. One value is applied to all four margins. Two values are applied to the top and bottom and right and left margins. Three values are applied to the top, right and left, and bottom margins. And four values are applied to the top, right, bottom, and left margins (think trouble).
- How to set the margin on a single side of an element

```
margin-top: .5em;
margin-right: 1em;
margin-bottom: 1em;
margin-left: 1em;
```

- How to set the margins on multiple sides of an element

```
margin: 1em; /* all four sides */
margin: 0 1em; /* top and bottom 0, right and left 1em */
margin: .5em 1em 2em; /* top .5em, right and left 1em, bottom 2em */
margin: .5em 1em 2em 1em; /* top .5em, right 1em, bottom 2em, left 1em */
```

How to set padding

- If you set the top and bottom margins for element to zero, you can use padding to set the spacing between the elements.
- Properties for setting padding
  - **padding-top** - A relative or absolute value that defines the space between the op of an element and its top border.
  - **padding-right** - A relative or absolute value that defines the space between the right side of an element and its right border.
  - **padding-left** - A relative or absolute value that defines the space between the left side of an element and its left border.
  - **padding** - One to four relative or absolute values that specify the padding on multiple sides of an element. One value is applied to all four sides. Two values applied to the top and bottom and right and left. Three values are applied to the top, right and left, and bottom. And four values are applied to the top, right, bottom, and left.

- How to set the padding on a single side of an element

  padding-top: 0;

  padding-right: 1em;

  padding-bottom: .5em;

  padding-left: 1em;

- How to set the padding on multiple sides of an element

  padding: 1em;

  padding: 0 1em;

  padding: 0 1em .5em;

  padding: 0 1em .5em 1em;