🌐Web Programming Technologies – Notes (CDAC CCEE)

Comprehensive notes covering key topics from Architecture of Web to Bootstrap for CCEE WPT preparation.

✅Session 1: Architecture of the Web

◆ 1. Brief History of the Internet

- **1969** – ARPANET (first packet-switched network)
- **1989** – Tim Berners-Lee proposed the World Wide Web
- **1991** – First browser: WorldWideWeb
- **1993** – Mosaic browser launched
- **1995** – JavaScript introduced

◆ 2. How Internet Works

- Browser requests → DNS resolves domain → IP address → Server response
- Protocols used: TCP/IP, HTTP, HTTPS

◆ 3. Internet Protocol (IP)

- **IPv4**: 32-bit, e.g., `192.168.0.1`
- **IPv6**: 128-bit, e.g., `2001:db8::1`

◆ 4. Domain Names & DNS

- DNS translates human-readable domain (e.g., google.com) to IP address

◆ 5. HTTP Protocol

- Stateless protocol, default port **80**
- Secure version: **HTTPS**, uses SSL/TLS on port **443**

◆ 6. HTTP Methods

Method	Purpose
GET	Retrieve data
POST	Send data
PUT	Update data
DELETE	Remove data

Method	Purpose
HEAD	Fetch headers only

◆ 7. HTTP Status Codes

Code	Meaning
200	OK
201	Created
301	Moved Permanently
404	Not Found
500	Internal Server Error

◆ 8. HTTP 1.0 vs 1.1 vs 2.0

Feature	HTTP/1.0	HTTP/1.1	HTTP/2.0
Connections	One per request	Persistent	Multiplexed
Server Push	No	No	Yes
Header Compression	No	No	Yes

◆ 9. Web Servers

Server	Platform	Use Case
Apache	Cross-platform	Open-source
IIS	Windows only	ASP.NET support

✅Session 2: HTML & HTML5

◆ 1. Basic Tags

- Structure: `<!DOCTYPE html>`, `<html>`, `<head>`, `<body>`
- Tags: `<h1> to <h6>`, `<p>`, `<a>`, `<img>`, `<ul>/<ol>`, `<li>`, `<table>`, `<iframe>`

◆ 2. HTML5 Features

- New Elements: `<header>`, `<footer>`, `<nav>`, `<section>`, `<article>`, `<figure>`
- Audio/Video Support: `<audio>`, `<video>`
- Input types: `email`, `url`, `date`, `range`, `color`

• Attributes: `required` , `pattern` , `min` , `max` , `step`

◆ 3. Geolocation API

```
navigator.geolocation.getCurrentPosition(successFn, errorFn);
```

• Needs user permission
• Requires HTTPS

◆ 4. ARIA Attributes (for accessibility)

Attribute	Use
aria-label	Label for assistive tech
aria-hidden	Hides element from screen reader
aria-expanded	Show/hide state of element

✅Session 3: CSS (Cascading Style Sheets)

◆ 1. Ways to Apply CSS

• Inline: `<p style="color: red;">`
• Internal: `<style>` in head
• External: `<link rel="stylesheet" href="style.css">`

◆ 2. Selectors

• Element: `p {}`
• Class: `.box {}`
• ID: `#main {}`

◆ 3. Box Model

```
[Margin]
  [Border]
    [Padding]
      [Content]
```

• `margin` : space outside border
• `padding` : space between border & content
• `border` : around the element
• `content` : actual data (text/image)

◆ 4. Fonts & Text

Property	Example
font-family	Arial, sans-serif
font-size	16px, 1em
font-weight	bold, 400
text-align	center, justify

◆ 5. Specificity Order

1. Inline style > 2. ID > 3. Class > 4. Element

✅ Session 4: Responsive Web Design & Bootstrap

◆ 1. Responsive Design

- Adapts UI to different screen sizes: desktop, tablet, mobile
- Uses media queries: `@media (max-width: 768px)`
- Flexible layouts using % or `vw`, `vh`

◆ 2. Bootstrap Overview

- Popular front-end framework
- Speeds up development with ready classes

◆ 3. Bootstrap Grid System

- 12-column layout
- Classes: `col-sm-6`, `col-md-4`, etc.
- Rows and columns:

```html
<div class="row">
  <div class="col-md-6">Left</div>
  <div class="col-md-6">Right</div>
</div>
```

◆ 4. Containers

- `.container` : Fixed width
- `.container-fluid` : Full-width

◆ 5. Components

Component	Class Example
Buttons	`.btn` , `.btn-primary`
Alerts	`.alert alert-warning`
Navbars	`.navbar` , `.navbar-dark`
Forms	`.form-control`
Grid Layout	`.row` , `.col-md-6`
Badges/Labels	`.badge` , `.label`
Progress Bar	`.progress` , `.progress-bar`

◆ 6. Typography & Other Classes

- Headings: `.h1` to `.h6`
- Text colors: `.text-primary` , `.text-danger`
- Backgrounds: `.bg-light` , `.bg-dark`
- Utility classes: `.mt-2` , `.p-3` , `.text-center`

◆ 7. Bootstrap Versions

- Bootstrap 3: Uses `navbar-inverse` , `.panel`
- Bootstrap 4: Uses Flexbox, `.card` , dropped `panel`
- Bootstrap 5: No jQuery, uses `.container-fluid` , improved utilities

🟦 Next Recommended: JavaScript (Events, DOM, Validation, OOP)