



Computer Science and Information Systems Department

CS341: Web Technologies

Syllabus- Fall Semester (Sep-Dec 2025)

FACILITATORS:

| | | | |
|--------------|----------------------------|---------------------------|---------------------------|
| Name | David Sampah | Kwadwo Osafo-Maafo | Kwadwo Osafo-Maafo |
| Role | Instructor (Cohort A) | Instructor (Cohort B) | Instructor (Cohort C) |
| Email | dsampah@ashesi.edu.gh | kgosafomaaf@ashesi.edu.gh | kgosafomaaf@ashesi.edu.gh |
| Office | zoom | TBA | TBA |
| Office Hours | Fri: 8-10 AM | Mon: Afternoon (2-4) | Mon: Afternoon (2-4) |
| | | | |
| Name | Hutton Amison-Addy | Barbara-Marie Doh | Barbara-Marie Doh |
| Role | Faculty Intern | Faculty Intern | Faculty Intern |
| Email | Hamison-addy@ashesi.edu.gh | bdoe@ashesi.edu.gh | bdoe@ashesi.edu.gh |
| Office | FIs Office | FIs Office | FIs Office |
| Office Hours | By Appointment | By Appointment | By Appointment |

TIMETABLE:

| | |
|-----------------|--|
| Course Web Page | CANVAS |
| Medium | Online & In-Person |
| Lectures – A | Mon, Wed 8:00 – 9:30 Jackson 221 & Online https://ashesi.zoom.us/j/4179992867 |
| Lectures – B | Mon, Wed 9:45 – 11:15 Jackson 221 & In person |
| Lectures – C | Mon, Wed 11:30 – 13:00 Jackson 221 & In person |
| Lab A | Fri 10:20 - Jackson 221 & In-Person |
| Lab B | Fri 12:15 - Jackson 221 & In-Person |
| Lab C | Fri 13:55 - Jackson 216 & In-Person |

OVERVIEW AND OBJECTIVE:

This course introduces students to the fundamental concepts and technologies involved in building modern web applications. It covers front-end and back-end development, web standards, protocols, and the tools and frameworks commonly used in the industry. The course emphasizes hands-on experience through practical assignments and projects. Topics covered will include basic and advanced HTML, CSS and JavaScript, Server-side programming (using both dominant and modern server-side languages), design and development based on requirement analysis, principles and tools for Web content creation, database fundamentals for the Web, security, content management systems (CMS) and e-commerce basics. The course will explore full-stack development using React, PHP, and Databases (relational and

non-relational). In a nutshell, the primary objective of this course is to introduce the relevant technologies and skills needed to design, develop, and deploy effective Web Applications.

LEARNING OUTCOMES:

Upon successful completion of this course, students should be able to:

- 1) Understand the architecture and components of web applications.
- 2) Develop static, responsive and interactive web pages using HTML, CSS, and JavaScript.
- 3) Build dynamic web applications using server-side scripting and databases.
- 4) Apply web security best practices.
- 5) Use existing platforms to develop web-application
- 6) Deploy a web-application successfully

ASHESI LEARNING GOALS:

Ethics and Civic Engagement: An Ashesi student is an ethical, responsible, and engaged member of his/her community. In this course, students are expected to uphold the highest academic integrity standard. They are expected to hold their peers and project teammates to the same academic and work ethics they practice.

Communication: An Ashesi student is an excellent communicator in a variety of ways. Students will blog about their experience in this course and group project every week.

Leadership and Teamwork: An Ashesi student is adept at leading and functioning in teams. In this course, students will work on a group project. Students are expected to be responsible and engage team members. We will discuss and use tools and methods for effective teamwork and software project management. At the end of the project, each student in a group will be assessed by the teammates on his/her contribution to the project.

Technological Competence: Students will become adept at using contemporary tools to develop web solutions and should be able to either start their own business or work in this area.

Innovative and Action-Oriented: An Ashesi student takes intellectual risks and demonstrates an entrepreneurial spirit. The course will consider several real-life problems that could be solved using web technology. Students are expected to produce diverse solutions that are functional.

PRE-REQUISITES:

Database Management Systems

TEACHING STYLE:

The lecture sessions include hands-on practicals on Web design, CSS, JavaScript, Content Management, Dynamic HTML, PHP, MySQL, Modularized Coding, Cookies & Session Handling, File Handling, Error handling, Authentication, and React. Always remind the lecturer to give a 5-minute break. Time spent is adjusted based on the ability of students and feedback. Some lecture videos will be recorded ahead of time and you are required to watch these videos before class.

SOFTWARE:

Software to be used for this class includes but is not limited to the following:

- ✓ Sublime
- ✓ XAMPP

- ✓ Visual Studio Code
- ✓ GIT
- ✓ CMS
- ✓ VirtualBox
- ✓ Vagrant

Alternative software packages may be suggested as required during the semester

TEXTBOOK:

Learning PHP, MySQL & JavaScript by Robin Nixon, Sixth Edition, O'Reilly.

SUPPLEMENTARY RESOURCES:

References:

- 1) PHP Manual: www.php.net
- 2) <https://react.dev/>
- 3) Microsoft Developer Network: msdn.microsoft.com
- 4) W3Schools: www.w3schools.com
- 5) Open-Source Web Development Resources: <https://free-for.dev/>
- 6) FreeCodeCamp: <https://www.freecodecamp.org/>
- 7) The Odin Project: <https://www.theodinproject.com/>

Reading:

- 1) *Eloquent JavaScript* by Marijn Haverbeke
- 2) *Learning Web Design* by Jennifer Niederst Robbins
- 3) *Getting Started with The Web* by Shelley Powers, O'Reilly Media Inc.
- 4) Web Content Management: Systems, Features, and Best Practices by Deane Barker, O'Reilly Publishers, First Edition – March 2016
- 5) [Fundamentals of Web Programming](#)

EVALUATION:

| | |
|----------------------------|-----|
| Participation / Quizzes: | 5% |
| Lab/Practical/Assignments: | 10% |
| Mid-Sem Exam: | 20% |
| Final Project: | 40% |
| Team Project: | 25% |

LATE POLICY:

Assignments are due as stated. Labs/long assignments handed in late will receive a 10% penalty per 12-hour period. As always, if there are mitigating circumstances (e.g., illness) for which an extension is needed, contact the instructor as early as possible **before the assignment is due** for the extension to be considered.

EXPECTATIONS:

The instructors and faculty intern are committed to helping you to be successful in this course. In return, there are some fundamental expectations of you.

Academic Honesty: You are expected to always keep in mind that *"An Ashesi student is an ethical, responsible and engaged member of his/her community."* The work in this course is designed to help you develop knowledge and skills essential to your future career success. You can develop these skills only if you do the work yourself.

All the work that you turn in *must* be your own. In general, you are allowed and encouraged to brainstorm about problems with your peers. You can talk about ideas and approaches. However, you must write the program or the problem solution you turn in yourself. You must also acknowledge everyone that you discuss an assignment with, in your submission. In source code, this can be done with a comment at the beginning of the program. For most assignments, you will work individually. For some assignments, you may work in pairs. Each pair can collaborate on the code and hand in one submission, and the names of both partners must be in the submission. In your programs, if you happen to copy a section of code (e.g., a helper method) from any source for any reason you must include an appropriate citation in a comment above the code segment that you copied. You may not copy work from the internet, from your peers, or from any other source, without proper citation, nor should you enable others, either intentionally or by negligence, to copy your work. You may find that some problems we may work on may have solutions available on the Internet.

Professionalism: You are expected to always interact with your course colleagues, as well as the instructor and teaching assistant, in a professional and polite manner.

Participation: Your active participation enriches the course experience for everyone. This includes asking and answering questions in class and participating in any discussions. Do not be afraid to ask questions! Your questions will help others in the class as well.

WEEKLY SCHEDULE:

Below is the schedule containing the topics to be covered. A detailed schedule, including assigned reading for each day, will be put on CANVAS, and updated periodically.

| Weeks | Lecture TOPIC | Lab / Practical / Quiz |
|-------------|---|---|
| Weeks 1 & 2 | Introduction: Web Technology <ul style="list-style-type: none">• History• IP, Domain & URL• Basic HTML and CSS• Git and development• HTTP Protocol• Web Trends | Networking Fundamentals Developer Workstation HTML lab CSS Lab Quiz1 AI - CV |
| Weeks 3 & 4 | Client-Side Technology <ul style="list-style-type: none">• HTML5• Cascading Style Sheet (CSS – Page layout) and CSS Libraries | Install VirtualBox, Vagrant Download a Linux Box Setup the Linux box as a web server Quiz2 |

| | | |
|--------------|--|---|
| | <ul style="list-style-type: none"> • JavaScript and Libraries (DOM) JavaScript Lab | |
| Weeks 5 & 6 | Server-Side Technology <ul style="list-style-type: none"> • Web Server Technology • Web Application Architecture (Full-Stack Development) • Data Processing and Storage • Server-Side Scripting: PHP • Web Security | Server-side programming lab (PHP). Final project starts Submit final project phase I Quiz3 Mid Exam |
| Week 7 | Mid-Sem Break | |
| Weeks 8 & 9 | Database (Relational & Non-Relational) <ul style="list-style-type: none"> • Database Access • Data Validation • Regular Expression • Error Handling • Data Presentation | Recap of database lab Quiz4 |
| week 10 & 11 | React Ajax API | React Ajax Lab Quiz 5 Team project presentation |
| week 12 & 13 | Web Application Platforms <ul style="list-style-type: none"> • Content Management Systems • Google Web Kit and AppEngine • Microsoft Web Technologies (ASP.Net) • Amazon Web Services • Others CMS Lab | Report on the others (AWS, Azure, etc.) Live hosting of project Quiz6 Final Project |

COMMUNICATION:

Assignments and relevant materials will be posted to CANVAS. Students are at liberty to send emails to the lecturer or faculty intern to book appointments, ask questions, seek permission about absences, etc. The lecturer or faculty intern will also send out emails where necessary. Visit CANVAS and check your emails regularly.

Please use the string "CS341" as a prefix on the subject line for emails related to this class. All of us have overflowing mailboxes and this can help us to organize them.