Syllabus for Advanced Web Application Programming

CIS 658 (Section 01) Winter 2026

CIS 658 focuses on the design and implementation of modern web applications with an emphasis on software engineering practices, scalable client-side architectures, and cloud-backed data services. Students will build a complete web application using a contemporary front-end framework and integrate it with a cloud database and authentication. The course covers front-end structure and state management, asynchronous data access, API usage, security basics for web apps, and testing and deployment practices. The work in this course is project-driven, with weekly milestones that lead to a final project presentation.

Contact Information:

Instructor:	Dr. Yong Zhuang
E-mail:	yong.zhuang@gvsu.edu
Office:	MAK D-2-234
Office Hours:	MW, 12:00 pm–1:00 pm, in-person (MAK D-2-234) and remote (Zoom)
Course Page:	Blackboard and Course Website
Zoom:	Meeting ID: 396 668 6420, Password: 587684
Section 01:	**Class time:** Monday, 6:00 pm–8:50 pm (in-person / synchronous) + asynchronous
	Room: DeVos Cntr Interprofess Health, Room 507 / Zoom
	Final presentation: Monday, April 27, 6:00 pm–7:50 pm

Course Objectives:

After completing this course, students should be able to:

- Design and implement a maintainable front-end architecture using Vue.js components and modern TypeScript practices.
- Manage application state using a store-based approach and reason about data flow across components.
- Integrate a web application with cloud services for data storage and user authentication.
- Use asynchronous programming patterns to build reliable data access layers and user experiences.
- Apply basic web security practices.
- Develop and evaluate a complete web application through iterative milestones, testing, and deployment-ready packaging.

Prerequisites:

CIS 500. Students should be comfortable with programming in at least one language and should have prior exposure to basic web concepts (HTML, CSS, and JavaScript) or be prepared to learn them quickly.

Course Materials:

No required textbook. Readings, tutorials, sample code, and reference links will be provided on the course website and Blackboard.

Course Delivery – Multiple Delivery:

This course is offered using a **Multiple Delivery** format. Students may choose to participate in class sessions:

- in person,
- online synchronously via Zoom, or
- asynchronously by viewing recorded sessions and completing required activities.

The specific combination of delivery methods may vary by week. Regardless of how you attend, you are responsible for the same learning outcomes, assignments, and deadlines.

Technology Requirements: Students attending remotely must have reliable internet access and a device with a webcam, microphone, and speakers. All students should log in to Zoom using their official GVSU account when joining live sessions.

Blackboard and Course Communication: All announcements, assignments, submissions, grades, and recordings will be managed through Blackboard. Course materials and additional resources will be provided at Course Website. Students are expected to check Blackboard and Course Website regularly.

Attendance and Participation: Attendance and participation requirements apply to both in-person and online students. Participation may include in-class activities, Zoom engagement, or completion of assigned online activities, depending on the week.

Recording Notice: Live class sessions may be recorded for instructional purposes and made available to enrolled students. If you have concerns related to accessibility or privacy, please contact the instructor early in the semester.

Technical Support: For technical issues related to Zoom, Blackboard, or login problems, contact GVSU IT Services at it@gvsu.edu or (616) 331–2101.

Expectations: I expect the following from you to support your learning:

a) check Blackboard and Course Website on a regular basis for announcements, due dates, and submissions

b) follow posted weekly milestones and keep your project repository organized and readable

c) adhere to the CIS & GVSU policy of Academic Honesty

Blackboard: Announcements, submissions, grades, and key links will be posted to Blackboard (https://lms.gvsu.edu/). It is your responsibility to stay informed.

Note: I use Blackboard announcements to communicate time-sensitive information (for example, changes to deadlines). Ensure that your Blackboard notification settings are set up so you receive updates as they are posted.

Grading Proportions:

Course Component	Overall Weight
In-class activities	5%
Quizzes (short concept checks)	20%
Milestones / Assignments	35%
Final Project (implementation + presentation)	40%
Total	**100%**

The instructor reserves the right to make minor adjustments to the point distribution.

Grade A	Grade B	Grade C	Grades D & F
$A \geq 93\%$	$B+ \geq 87\%$	$C+ \geq 77\%$	$D+ \geq 67\%$
$A- \geq 90\%$	$B \geq 83\%$	$C \geq 73\%$	$D \geq 60\%$
	$B- \geq 80\%$	$C- \geq 70\%$	$F < 60\%$

Course Policies:

Milestones, Due Dates, Attendance, and Participation:

- **Due dates:** All submissions are due at 11:59 pm Michigan time on the posted due date, regardless of how you attend class.
- **Late policy:** Submissions are expected by the deadline. If an emergency occurs, contact the instructor as soon as possible. Extensions are not guaranteed and will be handled on a case-by-case basis.
- **Attendance and participation:** This course uses a Multiple Delivery format. Students may participate in person, online synchronously, or asynchronously. Attendance and participation expectations apply to all students and may include in-class activities, Zoom participation, or completion of assigned online activities, depending on the week.
- **Asynchronous participation:** Students who do not attend a live session are responsible for reviewing posted materials and recordings and completing any required asynchronous activities by the specified deadlines.
- **Accommodations:** Students who require accommodations should inform the instructor as early as possible to ensure appropriate support across all delivery formats.
- The instructor reserves the right to modify course policies, schedules, and due dates when necessary.
- This course follows GVSU policies available at www.gvsu.edu/coursepolicies/.

Academic Honesty:

All students are expected to adhere to the academic honesty standards of Grand Valley State University. In addition, students in this course are expected to adhere to the academic honesty guidelines set forth by the College of Computing. Details can be found at https://www.gvsu.edu/computing/academic-honesty-93

I believe in the value of learning from peers, both in class and within the broader community. Collaboration is encouraged, but it must be balanced with academic integrity. Here's how you can collaborate responsibly:

- ☞ Document Collaborations: Clearly note any collaborations on individual assignments.
- ☞ No Code Sharing: Direct electronic transfer of code between students is not allowed.
- ☞ Cite Internet Sources: If you use code from the internet, provide an active link and ensure it doesn't constitute the entire solution.
- ☞ Engage Online Respectfully: Participate in forums for discussion, not for sharing solutions or soliciting complete answers.
- ☞ Discuss Conceptually: Talk about problems using non-technical, conceptual language rather than sharing specific code.
- ☞ Ultimately, you are responsible for all aspects of your submissions. You should be able to explain and defend your submission if the work is entirely your own.

Academic Resources: GVSU also provides opportunities for students to improve their academic skills through resources such as:

- **The writing center:** The Fred Meijer Center for Writing, with locations at the Allendale and Pew/Downtown Grand Rapids campuses, can assist you with writing for any of your classes. For more information about these services and locations, please visit their website: http://www.gvsu.edu/wc/
- **Speech lab:** The Grand Valley Speech Lab is a peer-to-peer communication center that helps students with all elements of oral presentations. For more information about this service, please visit their website: https://www.gvsu.edu/speechlab/
- **Research consultants:** The Center for Scholarly and Creative Excellence (CSCE) promotes a culture of active, engaged, ethical scholarship. It supports innovative faculty and student research and collaborative partnerships in the broader community. For more information, please visit their website: https://www.gvsu.edu/csce/
- **Library:** GVSU's library offers a vast collection of online resources available for students. Visit their website for more details: https://www.gvsu.edu/library/
- **Disability support resources:** If any student in this class has special needs because of a disability, please contact Disability Support Resources at http://www.gvsu.edu/dsr/ (DSR) at 616-331-2490.

Religious Observance: The university recognizes and respects religious traditions. If you require special accommodations for religious observances, inform the instructor in advance.

Emergency Procedures:

- ☞ **In Case of Emergency Fire**: Immediately proceed to the nearest exit during a fire alarm. Do not use elevators. More information is available on the University's Emergency website located at http://www.gvsu.edu/emergency.

Tentative Course Content (subject to change throughout the semester):

☞ **January 19, 2026 Martin Luther King, Jr. Day Recess:** No class!

☞ **March 8–14, 2026 Spring Break:** No class!

Week	Topics Covered
1	Syllabus, course overview, development environment setup (Docker), HTML, Quiz 1
2	**Martin Luther King, Jr. Recess (No Class)**
3	CSS fundamentals, CSS Grid and Flexbox, Assignment 1, Quiz 2
4	TypeScript fundamentals, Quiz 3
5	Term project introduction, TypeScript (advanced topics)
6	TypeScript (continued), Quiz 4
7	HTTP fundamentals, JavaScript modules, Vue.js fundamentals, Assignment 2
8	Vue.js (continued), Promises and asynchronous programming, Quiz 5
9	**Spring Break (No Class)**
10	State management with Pinia, Assignment 3
11	Vuetify (UI components and layout), Quiz 6
12	Vue Router, Assignment 4, Quiz 7
13	Cloud database integration with Firestore, Firebase Authentication
14	Fetch and Axios, ExpressJS overview, Assignment 5
15	Project studio: milestone integration, performance checks, deployment preparation, presentation preparation
16	**Final Project Presentation (Week of April 27)**