Full Stack Web Development (FWEB)

AY2025/2026 October Semester

Project Specification

Introduction

This is an **individual** project.
This project aims to understand and apply the knowledge of dynamic web application development to develop a web application using the MERN stack. (Mongo, Express.js, React.js, and NodeJS)

Assessment Components:

- Part 1: Project Proposal (20%) - Week 05
- Part 2: Minimal Viable Product (45%) - Week 12
- Part 3: Final Web Application (35%) - Week 16

You must choose one case study from the provided options. The selected case study will be used for all parts of the assessment as you work on developing a suitable solution.

Case Study Options (*The problem statement serves as a starting point; you can use it as is or adapt it based on your users' specific needs.*):

1. **Campus Event Management System**
   Problem Statement: Students often miss out on campus events due to scattered announcements, lack of reminders, and complicated registration processes, leading to low participation and poor event visibility.

2. **Library Book Finder & Reservation System**
   Problem Statement: Students waste time searching for books in the library without knowing their availability, resulting in frustration and missed opportunities to access learning resources.

3. **Peer-to-Peer Learning / Tutor Finder**
   Problem Statement: Students often need academic help but struggle to find peers with the right expertise, leading to missed learning opportunities and uneven access to support.

4. **Internship & Job Portal for Students**
   Problem Statement: Students often struggle to find internships and job opportunities relevant to their courses, as postings are scattered across multiple platforms with no campus-specific matching.

Project Deliverables:

- **Part 1: Project Proposal (20%):** Prepare a project proposal for a proposed app. Include a clear problem definition, project objectives, proposed features, wireframe, and data modeling.

- **Part 2: Minimal Viable Product (45%):** Develop a minimal viable product (MVP) for the proposed app, focusing on front-end functionality, including the implementation of components, navigation, and interactive UI elements.

- **Part 3: Final Web Application (35%):** Deliver a fully functional web application integrating front-end and back-end components, including one well-researched advanced feature. Evaluation will focus on the correct implementation of databases and server-side functionality, the integration between front-end and back-end, and the successful implementation of the advanced feature.

All templates are in TP LMS under the All About Assessments folder.

Part 1: Project Proposal (20%)

You are required to submit a **project proposal** for your proposed web application. The proposal must include the following components:

1. **Problem Definition/Customer Needs (4%)**
    - Identify and list all key problems from the chosen scenario.
    - Clearly define the customer needs and challenges.

2. **Project Objectives (3%)**
    - The purpose of the web application, and why it is needed?
    - Who are the target users?
    - What is the unique value proposition of your application?

3. **Proposed Features (3%)**
    - Outline the planned functionalities in detail.

4. **Wireframe (5%)**
    - Include wireframes, mockups, or sketches showing the intended interface and flow. High-fidelity prototypes are not required; simple sketches or basic mockups are sufficient.
    - Include **at least three** main pages.

5. **Data Modeling (5%)**
    - Initial identification of entities in your application.
    - Include **at least four** key data models and provide sample attributes and data for each model.

Submit the report in LMS under the "**All About Assessment**" folder.
The report must be named with the format ***YourName_StudentID_YourClass_Part1.pptx***
(e.g.: JohnTan_1234567D_P01_Part1.pptx)

Please ensure that you have a backup copy of your deliverables in case there is a problem with the online submission.

The deadline for project proposal submission is on **Week 5, 17th Nov 2025, Monday at 9:00 am.**

Note: You must be prepared to explain your report and the processes involved when your tutor requests it.

Part 2: Minimal Viable Product (MVP) (30%)

You are required to submit your **project source code with the academic declaration.**

Your web application will be assessed based on the following components:

1. **Page components & Routing (10%)**
   - Are all components implemented correctly?
   - Does the routing and navigation function smoothly across the application?

2. **UI Implementation (5%)**
   - Is the user interface visually consistent?
   - Does the overall interface look professional and visually appealing?
   - **Note:** Students may use any CSS framework or library from the approved list: **Bootstrap, Tailwind CSS, Material-UI, or plain CSS**.

3. **State Management (5%)**
   - Are React state, props, and events used correctly to handle dynamic updates?
   - Do components update as expected based on user interactions?

4. **Basic Functionality (10%)**
   - Do all core features (e.g., buttons, form submissions, navigation) work correctly?
   - Can the application handle edge cases without crashing?

Submit the entire project folder as a zipped file in LMS under the Assessment folder. Please ensure that you have a backup copy of your application if there is a problem with the online submission.

The zip file must be named in the format: ***YourName_StudentID_YourClass_Part2.zip*** *(e.g.: JohnTan_1234567D_P01_Part2.zip)*

The deadline for MVP submission is on **Week 12, 5th Jan 2025 Monday at 9:00 am.**

MVP Presentation & Demonstration (15%)

You are to do a 10 to 15-minute presentation and demonstration of your application. You must be prepared to show and explain your code when requested during the presentation in Week 12.

Part 3: Final Web Application (20%)

You are required to submit your **project source code with the academic declaration.**

Your web application will be assessed based on the following components:

1. **Integration of Back-end with Database (10%)**
   - Has the back end correctly implemented database models?
   - Can the back-end handle CRUD operations and query data from the database?

2. **Integration of Front-end and Back-end (5%)**
   - Does the front-end communicate correctly with the back end?
   - Are the data displayed and updated accurately in the user interface?

3. **Additional feature (5%)**
   - Research and implement **one additional feature** from the suggested additional features list.

Suggested Additional Features

1. **Gamification**: Introduce badges, points, or rewards for participation and achievements to make using the web application more engaging and motivating.

2. **AI Recommendations**: Provide personalized suggestions to users based on their past activity or preferences, enhancing the relevance of the web application.

3. **Interactive Dashboard:** Provide students with a visual summary of their activities, making the app informative and engaging.

4. **Deployment & GitOps:** Make your web application accessible online by deploying it to a hosting platform.

Submit the entire project folder as a zipped file in LMS under the Assessment folder. Ensure that you have a backup copy of your application in case there is a problem with the online submission.

The zip file must be named in the format: ***YourName_StudentID_YourClass_Part3.zip*** *(e.g.: JohnTan_1234567D_P01_Part3.zip)*

The deadline for the Final Web Application submission is on **Week 16, 2nd February 2026, Monday at 9:00 am**.

Final Web Application - Presentation and Demonstration (15%)

You are to do a 10 to 15-minute presentation and demonstration of your completed application. You must be prepared to show and explain your code when requested during the presentation **in weeks 16 or 17.**

Penalty for Late Submission

late and <1 day: 10% deduction from absolute mark given for the assignment late
>=1 and <2 days: 20% deduction from absolute mark
late >=2 days: No marks awarded

Submission Guidelines

When submitting assignments, each student is responsible for ensuring that they do not submit an empty zip file or a corrupted file.

Students must also ensure they are using a suitable device when working on assignments/projects, maintain proper backups of their work, and do not cite 'laptop issues' as a reason for assignment extensions, as such reasons will not be considered.

Project Grading Criteria – Project Proposal (20%)

Criteria	In Context	Performance Level				
		A	B	C	D	F
Problem Definition / Customer Needs (4%)	**Problem Identification** **Clarity & Explanation** **Evidence-Based Support**	All key problems are clearly identified and well explained. Customer needs and challenges are clearly defined and strongly supported with evidence or data.	Most key problems are identified with clear explanations. Customer needs and challenges are defined with some supporting evidence.	Some key problems are identified, but may not be well explained. Customer needs and challenges are mentioned, but with limited evidence or clarity.	A few problems are identified, but explanations are vague. Customer needs and challenges are unclear or poorly linked to the problems.	Problems are missing or irrelevant. Customer needs and challenges are not defined.
Project Objectives (3%)	**Purpose Clarity** **User Understanding** **Value Proposition**	The purpose is apparent and well-explained. Users are clearly identified and well understood. The value proposition is strong and specific.	The purpose is clear. Users are defined with some understanding. The value proposition is good, but could be more detailed.	The purpose is somewhat clear. Users are mentioned but not well defined. The value proposition is too general.	The purpose is unclear or vague. Users are poorly defined or not well understood. The value proposition is weak or lacks connection to user needs.	No clear purpose. Users not identified. No or irrelevant value proposition.
Proposed Features (3%)	**Completeness** **Clarity**	Features are clearly detailed and well-explained.	Features are clear and mostly detailed.	Features are listed but lack detail.	Features are vague or incomplete.	Features are missing, irrelevant, or not explained.
Wireframe (5%)	**Clarity** **Navigation**	Includes 3+ clear wireframes showing layout and flow of main pages.	Includes at least 3 wireframes with basic layout and flow.	Includes at least 3 wireframes, but they are incomplete.	Wireframes are poorly done or lack relevance.	Wireframes are missing.
Data Modeling (5%)	**Identification of Key Models & Attributes** **Logical Design**	Identifies 4+ key data models with sample attributes; models are logical.	Identify at least 4 models with some attributes; mostly logical.	Identify at least 4 models, but they lack detail.	Models are vague or not well-structured.	Data models are missing or not aligned with the application.

Project Grading Criteria – Minimal Viable Product (30%)

Criteria	In Context	Performance Level				
		A	B	C	D	F
Page Components & Routing (10%)	**Component Functionality** **Routing/Navigation** **User Experience**	All components work correctly with no errors. Routing is smooth, intuitive, and user-friendly.	Most components are implemented correctly. Routing works well with only minor issues.	Some components are missing or incomplete. Routing works, but feels slightly confusing.	Some components are implemented but do not work properly. Routing has noticeable issues or confusion in navigation.	No components are implemented, or do not work. Routing is broken or missing.
UI Implementation (5%)	**Visual Design** **Consistency**	UI is visually consistent throughout. Design looks polished and professional.	UI is mostly consistent with only minor differences. Overall presentation is clear and neat.	UI is somewhat consistent but has noticeable variations. Design looks acceptable but lacks refinement.	UI has several inconsistencies in layout or elements. Visual appearance is unpolished or cluttered.	UI is inconsistent or incomplete. Layout and elements appear disorganized or missing.
State Management (5%)	**Correct Usage** **Component Behavior**	State, props, and events are all used correctly and efficiently. Components update smoothly and behave exactly as expected.	Mostly correct use of state, props, and events. Components update properly with only minor issues.	Some errors in using state, props, or events. Components update, but not always as intended.	Minimal use of state, props, or events. Components often fail to update correctly.	No state, props, and events were implemented.
Basic Functionality (10%)	**Functionality** **Error Handling/Edge Cases** **Robustness**	All core features work correctly and handle edge cases gracefully.	Most core features work; minor issues with edge cases.	Core features are present, but some do not work as expected.	Many core features are broken or unreliable.	Core features are missing or non-functional.

Project Grading Criteria – Final Web Application (20%)

Criteria	In Context	Performance Level				
		A	B	C	D	F
Integration of Back-end with Database (10%)	**Database Design** **Functionality & Queries**	Database models are well implemented. CRUD operations and queries are working well.	Database models are mostly correct and functional. CRUD operations and queries work well with some minor issues in queries or logic.	Database models are poorly implemented. CRUD operations and queries are working partially.	Database Models and CRUD operations are poorly implemented.	Database integration is missing or non-functional.
Integration of Front-end and Back-end (5%)	**Integration Quality** **Functionality**	Front-end integration seamlessly with back end. Data is displayed and updated accurately at the front-end.	Front-end integration with the back end works with minor issues. Data mostly displays and updates correctly in the front-end.	Some basic integration is present. Some data may not display or update properly in the front-end.	Integration is inconsistent. Major issues with data display or updates in the front-end.	No integration between front-end and back-end.
Additional Feature (5%)	**Research & Planning** **Implementation Quality**	Successfully implements a well-researched additional feature from the suggested list.	Implements an additional feature with some minor issues.	Attempt to implement the additional feature, but the functionality is basic or incomplete.	Attempt to implement the additional feature, but the functionality is not working.	No additional feature implemented.

Project Grading Criteria – Presentation & Demonstration (15% each)

Criteria	In Context	Performance Level				
		A	B	C	D	F
Clarity of Explanation (5%)	**Communication** **Confidence**	Explanation is clear, logical, and well-structured. Able to articulate ideas confidently.	Explanation is mostly clear and logical with minor gaps. Generally confident when articulating ideas.	Explanation is somewhat clear but lacks structure or detail. Shows some hesitation when articulating ideas.	Explanation is unclear, disorganized, or difficult to follow. Lacks confidence when articulating ideas.	Explanation is unclear, disorganized, or missing. Struggles to express ideas and lacks coherence.
Understanding of Features (5%)	**Depth of Understanding** **Clarity of Explanation**	Demonstrates deep understanding of all features. Explain how and why each feature works clearly.	Demonstrates good understanding of most features. Provides reasonable explanations for their functionality.	Demonstrates basic understanding of some features. Explanations are brief or partially correct.	Limited understanding of features. Struggle to explain how the features function sometimes.	Shows little to no understanding of the features. Unable to explain how features work or why they were implemented.
Answering Questions (5%)	**Accuracy** **Relevance**	Answer all questions correctly and confidently. Provides relevant responses.	Answer most questions correctly with minor hesitation. Responses are generally relevant.	Answer some questions correctly Responses show some thought but may lack relevance or depth.	Answer very few questions correctly. Responses are mostly inaccurate or irrelevant.	Fails to answer questions correctly. Responses are irrelevant or show no understanding.