Syllabus Details

Syllabus ID:	12580
Syllabus Name:	**Front-End web development with React_Phát triển web Front-End với React**
Course Name English:	**Front-End web development with React**
Subject Code:	**FER202**
NoCredit:	3
Degree Level:	Bachelor
Time Allocation:	Study hour (150h) = 45h contact hours + 1h final exam + 85' practical exam + 104h self-study
Pre-Requisite:	WED201c
Description:	Learn front-end web development for implementing a multi-platform solution: - Overview of client-side web UI frameworks, focusing on Bootstrap. Students will explore grids, responsive design, Bootstrap CSS, and JavaScript components. - Basics of Node.js, npm - JavaScript-based front-end development with the React library: ES6 for React applications, Reactstrap for Bootstrap-based responsive UI, React components, React Router for single-page applications, and designing controlled forms. - Hooks to leverage React features like state and lifecycle in functional components, reducing reliance on class components. - Flux architecture and Redux, covering Redux principles and building React-Redux powered applications. Fetch for client-server communication, integrating REST APIs on the server side. - Modern syntax and patterns for ReactJS development, paired with foundational knowledge to ensure long-term relevance. - AI Integration: Use of AI tools (e.g., code generation with GenAI) to enhance development efficiency, with emphasis on transparency and ethical usage. - Assessment Methods: Evaluation through practical labs, assignments, and reviews using stratified sampling, scored via Likert scales (1-5) for syntax, logic, customization, and transparency, converted to a 10-point scale.
StudentTasks:	- Students must attend at least 80% of contact slots to be eligible for the final examination. - Students are responsible for completing all exercises assigned by the instructor in class or at home and submitting them on time. - Regularly check announcements on FU FLM at https://flm.fpt.edu.vn/ for the latest course updates, including assignment submission deadlines and feedback on assignments and project work. - AI-Related Task: Utilize AI tools (e.g., GenAI for code generation or debugging) responsibly in assignments and projects, and clearly document their usage (e.g., prompts, outputs) in submissions to ensure transparency and ethical application.
Tools:	- Visual Studio Code (https://code.visualstudio.com) - Internet - Git (Bitbucket/Github source management) - Node.js AI tools - Gemini (https://gemini.google.com/app) - Grok (https://grok.com/) - ChatGPT (https://chatgpt.com/)
Scoring Scale:	10
DecisionNo MM/dd/yyyy:	359/QĐ-ĐHFPT dated 04/09/2025
IsApproved:	**True**
Note:	
MinAvgMarkToPass:	5
IsActive:	True
ApprovedDate:	4/9/2025

3 material(s)

MaterialDescription	Author	Publisher	PublishedDate	Edition	ISBN	IsMainMaterial	IsHardCopy	IsOnline	Note
https://getbootstrap.com/docs/5.3/getting-started/introduction/						☑	☐	☑	
https://react.dev/learn						☑	☐	☑	
https://react.dev/learn/start-a-new-react-project#nextjs						☐	☐	☑	

9 LO(s)

CLO Name	CLO Details
CLO1	Describe Front-end Web UI Frameworks overview

CLO2	Install React application and Understand React component
CLO3	Explain JSX and ES6
CLO4	Explain the Bootstrap, React-boostrap
CLO5	Discuss the React Component Life Cycle, Forms and Routes
CLO6	Discuss Hook, Event Handling and crafting reusable component in React
CLO7	Discuss fetch and catching data in Client-Server Communication and Code Splitting Using Lazy Components and Suspense
CLO8	Discuss Flow Architecture and Redux
CLO9	Apply AI tools in React development and evaluate their ethical use and transparency

View mapping of CLOs to PLOs

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Session	Topic	Learning-Teaching Type	LO	ITU	Student Materials	S-Download	Lecturer Materials	T-Download	Student's Tasks	Lecturer Tasks	URLs
1	Assignment Introduction with AI Integration	Offline	CLO1-CLO9	I, T	Assignment brief	FER202	Assignment rubric, slides, AI tool	FER202	Study assignment brief, brainstorm app idea with AI, note CLO1-CLO9 requirements	Introduce assignment, demo AI use for ideation, explain rubric (Present assignment goals, show AI tool (e.g., ChatGPT, Grok, Gemini) for brainstorming, clarify rubric criteria)	
2	Course Introduction 1.1 Full Stack Web Development: The Big Picture 1.2 React 19 Introduction	Offline	CLO1	I	Slides	Outline course structure, discuss full-stack roles, highlight React 19 updates	Slides		Study slides, note key concepts of full-stack and React 19	Introduce course overview, explain full-stack context and React 19 features (Outline course structure, discuss full-stack roles, highlight React 19 updates)	
3	1.3 Git - Setting up Git - Basic Git Commands - Setting up an Online Git repository 1.4 Node.js and npm - Setting up Node.js and npm - Basics of Node.js and npm	Offline	CLO1	I, T, U	Slides	Explain Git purpose, demo git init/add/commit on terminal, troubleshoot install issues Show GitHub signup, demo git push, guide Node.js/npm install with version check	Slides, Git demo, Node.js demo		Install Git, practice basic commands (init, add, commit), study slides Create GitHub account, push repo, install Node.js/npm, study slides	Review slides, demo Git setup and commands, guide installation Introduce GitHub, guide repo setup, demo Node.js/npm installation (Explain Git purpose, demo git init/add/commit on terminal, troubleshoot install issues Show GitHub signup, demo git push, guide Node.js/npm install with version check)	
4	Rendering with JSX + ES 6 2.1 ES6	Offline	CLO3	I, T	Slides	Present ES6 syntax (e.g., () =>), demo in browser console, assign practice tasks	Slides		Study ES6 features (arrow functions, destructuring), practice examples	Introduce ES6, explain key features, guide initial ES6 exercises (Present ES6 syntax (e.g., () =>), demo in browser console, assign practice tasks)	

5	2.2 ES6 (cont'd) - Using AI to generate ES6 code snippets	Offline	CLO3, CLO9	T, U	Slides, exercises, AI tool	Show AI Prompt (e.g., "Generate ES6 map"), explain output, check student snippets	Slides, exercises, AI tool		Use GenAI (e.g., ChatGPT) to generate ES6 snippets, compare with slides, do exercises	Demo AI tool for ES6 code generation, guide usage, review outputs (Show AI Prompt (e.g., "Generate ES6 map"), explain output, check student snippets)	
6	2.3 ES6 (cont'd)	Offline	CLO3	U	Slides, exercises	Answer questions, review exercise submissions, suggest improvements	Slides, exercises		Complete ES6 exercises, apply to simple React components	Review slides, assist with exercises, provide feedback (Answer questions, review exercise submissions, suggest improvements)	
7	3.1 Rendering HTML 3.2 Creating your own JSX elements	Offline	CLO3	T, U	Slides	Explain JSX vs HTML, demo {variable} , guide JSX element creation	Slides		Study JSX syntax, create basic JSX elements, practice rendering	Introduce JSX, demo rendering HTML with JSX, guide practice (Explain JSX vs HTML, demo {variable} , guide JSX element creation)	
8	3.3 Using JavaScript expressions	Offline	CLO3	U	Slides	Review expression syntax (e.g., {count + 1}), assist with practice, provide examples	Slides		Use JS expressions in JSX, practice with examples	Review slides, guide JS expression usage in JSX (Review expression syntax (e.g., {count + 1}), assist with practice, provide examples)	
9	3.4 Building fragments of JSX LAB 1: Install React + JSX Basics	Offline	CLO1, CLO2, CLO3	T, U	Slides, lab questions	Explain Lab 1 goals, demo CRA setup, troubleshoot JSX issues	Slides, AI tool, lab 1 prompt		Install React app with CRA, build JSX fragments, complete Lab 1	Review Lab 1 requirements, assist with setup and JSX tasks (Explain Lab 1 goals, demo CRA setup, troubleshoot JSX issues)	
10	Review Lab 1	Offline	CLO1, CLO2, CLO3, CLO9	U	Lab submissions	Run AI on submissions (e.g., syntax check), review 10 students (13.5 min each), discuss	Lab solutions, AI tool, Lab 1's review table questions		Submit Lab 1, use AI to debug code, prepare questions for review	Use AI to analyze submissions, conduct 1-1 review for 10 students, provide feedback (Run AI on submissions (e.g., syntax check), review 10 students (13.5 min each), discuss)	
11	Review Lab 1 (td)	Offline	CLO1, CLO2, CLO3, CLO9	U	Lab submissions	Run AI on submissions (e.g., syntax check), review 10 students (13.5 min each), discuss	Lab solutions, AI tool, Lab 1's review table questions		Submit Lab 1, use AI to debug code, prepare questions for review	Use AI to analyze submissions, conduct 1-1 review for 10 students, provide feedback (Run AI on submissions (e.g., syntax check), review 10 students (13.5 min each), discuss)	

12	Bootstrap and React-bootstrap 4.1 Bootstrap & React-Bootstrap Introduction - Set up a project with Bootstrap & React-Bootstrap - Configure a web project to use Bootstrap and React-Bootstrap	Offline	CLO4	I, T	Slides	Present BS5 features, demo npm install bootstrap, guide React-BS integration	Slides		Study Bootstrap/React-Bootstrap, set up project with both	Introduce BS5 and React-Bootstrap, demo setup, guide installation (Present BS5 features, demo npm install bootstrap, guide React-BS integration)	
13	4.2 Bootstrap Grid System	Offline	CLO4	T, U	Slides	Show grid classes (e.g., col-md-6), demo responsive layout, assist with exercises	Slides		Practice grid system layouts, apply to sample UI	Review slides, demo grid system, guide exercises (Show grid classes (e.g., col-md-6), demo responsive layout, assist with exercises)	
14	4.3 Bootstrap and React-Bootstrap CSS Components - Navigation and Navigation Bar - Icon and Fonts - User Input: Buttons and Forms - Tabular data (Table)	Offline	CLO4	T, U	Slides, exercises	Demo <Navbar> and <Button>, explain props, review student UI builds	Slides, exercises		Build UI with BS components (nav, buttons), do exercises	Guide BS/React-BS component usage, assist with exercises (Demo <Navbar> and <Button>, explain props, review student UI builds)	
15	5.1 Bootstrap JavaScript Components - Tabs, Pills and Tabbed Navigation	Offline	CLO4	T, U	Slides, exercises	Show <Tabs> usage, demo interactivity, guide testing	Slides, exercises		Implement JS components (tabs/pills), test functionality	Demo BS JS components, guide implementation (Show <Tabs> usage, demo interactivity, guide testing)	
16	5.2 Hide and Seek: Collapse and Accordion	Offline	CLO4	U	Slides, exercises	Explain <Collapse>, review student implementations, suggest enhancements	Slides, exercises		Add collapse/accordion to UI, practice interactivity	Review slides, assist with BS interactivity features (Explain <Collapse>, review student implementations, suggest enhancements)	
17	5.3 Compare betweent Bootstrap and React-Bootstrap	Offline	CLO4	T, U	Slides, exercises	Discuss BS vs React-BS pros/cons	Slides, exercises		Build UI with BS/React-BS	Introduce comparison (Discuss BS vs React-BS pros/cons)	
18	LAB 2: Bootstrap and React-Bootstrap UI	Offline	CLO4	T, U	Slides, lab questions	Explain Lab 2 goals, troubleshoot UI issues	Slides, AI tool, lab 2 prompt		Compare in Lab 2, submit work	Review Lab 2 requirements, assist with tasks (Explain Lab 2 goals, troubleshoot UI issues)	

19	Review Lab 2	Offline	CLO4, CLO9	U	Lab submissions	Analyze submissions with AI (e.g., CSS efficiency), review 10 students, give feedback	Lab solutions, AI tool, Lab 2's review table questions		Submit Lab 2, use AI to optimize UI code, prepare for review	Use AI to check submissions, conduct 1-1 review for 10 students, provide feedback (Analyze submissions with AI (e.g., CSS efficiency), review 10 students, give feedback)	
20	Review Lab 2 (td)	Offline	CLO4, CLO9	U	Lab submissions	Analyze submissions with AI (e.g., CSS efficiency), review 10 students, give feedback	Lab solutions, AI tool, Lab 2's review table questions		Submit Lab 2, use AI to optimize UI code, prepare for review	Use AI to check submissions, conduct 1-1 review for 10 students, provide feedback (Analyze submissions with AI (e.g., CSS efficiency), review 10 students, give feedback)	
21	React Component 6.1 What's react component? How to build it? 6.2 Component Properties	Offline	CLO2	I, T, U	Slides	Explain component structure, demo <Comp prop="value" />, guide initial build	Slides		Study component basics, build a simple component with props	Introduce React components, demo creation process (Explain component structure, demo <Comp prop="value" />, guide initial build)	
22	6.3 Component State - Setting initial component state - Creating component state - Merging component state	Offline	CLO2	I, T	Slides, exercises	Show state = {} in class, demo useState, assign state exercises Demo setState merging, guide functional state updates, review student work	Slides, exercises		Practice setting initial state in components, do exercises Build components with state (Class/Functional), merge state, practice	Explain props vs state, guide exercises Review slides, assist with state merging exercises (Show state = {} in class, demo useState, assign state exercises Demo setState merging, guide functional state updates, review student work)	
23	Event Handling 7.1 Declaring event handlers - Binding handlers to elements - Using synthetic event objects - Understanding event pooling	Offline	CLO6	I, T, U	Slides, exercises	Explain onClick, demo binding in class/functional, guide event setup Show event.target, discuss pooling, assist with exercises	Slides, exercises		Study event handling, bind handlers to elements, practice Practice synthetic events, explore pooling, do exercises	Introduce events in React, demo binding techniques Explain synthetic events, guide practice (Explain onClick, demo binding in class/functional, guide event setup Show event.target, discuss pooling, assist with exercises)	
24	7.2 Using event handler context and parameters - Declaring inline event handlers LAB 3: Class vs Functional Components	Offline	CLO2, CLO6	T, U	Slides, exercises, lab questions	Demo inline onClick={() => ...}, explain Lab 3 goals, assist with comparison	Slides,, exercises, AI tool, lab 3 prompt		Add inline handlers, compare Class/Functional in Lab 3, submit work	Guide inline handler usage, review Lab 3 requirements (Demo inline onClick={() => ...}, explain Lab 3 goals, assist with comparison)	

25	Review Lab 3	Offline	CLO2, CLO6, CLO9	U	Lab submissions	Check submissions with AI (e.g., refactor suggestions), review 10 students, discuss	Lab solutions, AI tool, Lab 3's review table questions		Submit Lab 3, use AI to refactor code, prepare for review	Use AI to analyze submissions, conduct 1-1 review for 10 students, provide feedback (Check submissions with AI (e.g., refactor suggestions), review 10 students, discuss)	
26	Review Lab 3 (td)	Offline	CLO2, CLO6, CLO9	U	Lab submissions	Check submissions with AI (e.g., refactor suggestions), review 10 students, discuss	Lab solutions, AI tool, Lab 3's review table questions		Submit Lab 3, use AI to refactor code, prepare for review	Use AI to analyze submissions, conduct 1-1 review for 10 students, provide feedback (Check submissions with AI (e.g., refactor suggestions), review 10 students, discuss)	
27	8.1 Passing property values 8.2 Stateless Components	Offline	CLO5	T, U	Slides	Demo <Comp prop={value} />, explain stateless benefits, guide practice	Slides		Build stateless components, pass props, practice	Review slides, guide props passing and stateless design (Demo <Comp prop={value} />, explain stateless benefits, guide practice)	
28	Container components 8.3 Providing and consuming contex	Offline	CLO5	T, U	Slides	Show Context.Provider, demo data sharing, assist with implementation	Slides		Implement context in components, test data sharing, practice	Introduce context, demo usage in containers (Show Context.Provider, demo data sharing, assist with implementation)	
29	8.4 Render props 8.5 Refactoring class components using hooks	Offline	CLO6	T, U	Slides	Demo <Comp render={() => ...} />, show Hook conversion, assist with exercises	Slides		Refactor class components with Hooks, practice render props	Introduce Hooks, guide refactoring exercises (Demo <Comp render={() => ...} />, show Hook conversion, assist with exercises)	
30	Getting Started with Hooks 9.1 Maintaining state using Hooks	Offline	CLO6	I, T	Slides	Explain useState syntax, demo counter example, assign practice tasks	Slides		Study useState, implement in a component, practice	Introduce Hooks, demo useState, guide practice (Explain useState syntax, demo counter example, assign practice tasks)	
31	9.2 Performing initialization and cleanup actions	Offline	CLO6	T, U	Slides, exercises	Show useEffect(() => {}, []), demo cleanup, review exercises	Slides, exercises		Use useEffect for lifecycle tasks, do exercises	Explain useEffect, guide initialization/cleanup exercises (Show useEffect(() => {}, []), demo cleanup, review exercises)	
32	9.3 Sharing Data with Context Hooks	Offline	CLO5, CLO6	T, U	Slides	Demo useContext, show data flow, guide multi-component sharing	Slides		Implement context Hooks, share data across components, practice	Demo context Hooks, assist with data sharing (Demo useContext, show data flow, guide multi-component sharing)	

33	9.4 Using Reducer Hooks for State Management LAB 4: Hooks & Events	Offline	CLO6	T, U	Slides, lab questions	Explain useReducer vs useState, demo Lab 4 setup, troubleshoot event issues	Slides, AI tool, lab 4 prompt		Use useReducer for complex state, complete Lab 4 with events	Introduce useReducer, review Lab 4 requirements, assist with tasks (Explain useReducer vs useState, demo Lab 4 setup, troubleshoot event issues)	
34	Review Lab 4	Offline	CLO6, CLO9	U	Lab submissions	Analyze event logic with AI, review 10 students (stratified), suggest improvements	Lab solutions, AI tool, Lab 4's review table questions		Submit Lab 4, use AI to enhance event logic, prepare for review	Use AI to evaluate submissions, conduct 1-1 review for 10 students, provide feedback (Analyze event logic with AI, review 10 students (stratified), suggest improvements)	
35	Review Lab 4 (td)	Offline	CLO6, CLO9	U	Lab submissions	Analyze event logic with AI, review 10 students (stratified), suggest improvements	Lab solutions, AI tool, Lab 4's review table questions		Submit Lab 4, use AI to enhance event logic, prepare for review	Use AI to evaluate submissions, conduct 1-1 review for 10 students, provide feedback (Analyze event logic with AI, review 10 students (stratified), suggest improvements)	
36	Progress Test - 01	Offline	CLO1-CLO6	T, U	Test questions	Upload test to Exam website, monitor testing, collect submissions	Examination		Study materials, complete Progress Test 1	Prepare examination, administer test (Upload test to Exam website, monitor testing, collect submissions)	
37	Handling Navigation with Routes 10.1 Declaring routes - Decoupling route declaration	Offline	CLO5	I, T	Slides	Explain <Route>, demo basic routing, guide setup	Slides		Study React Router, set up basic routes, practice	Introduce React Router, demo route declaration (Explain <Route>, demo basic routing, guide setup)	
38	10.2 Handling route parameters - Resource IDs in routes - Optional parameters	Offline	CLO5	T, U	Slides	Show /:id, demo parameter access, assist with exercises	Slides		Add route parameters, test navigation, practice	Explain route parameters, guide implementation (Show /:id, demo parameter access, assist with exercises)	
39	10.3 Using link components - Basic linking - URL and query parameters	Offline	CLO5, CLO7	T, U	Slides	Demo <Link to="/">, explain Lab 5 goals, troubleshoot lazy loading	Slides		Build routed app with <Link> and lazy loading, complete Lab 5	Review Lab 5 requirements, assist with routing and lazy loading (Demo <Link to="/">, explain Lab 5 goals, troubleshoot lazy loading)	

40	Code Splitting Using Lazy Components and Suspense 11.1 Using Lazy API 11.2 Using the Suspense component -Simulating latency	Offline	CLO7	T, U	Slides	Demo React.lazy(() => import()), show <Suspense>, guide latency practice	Slides		Use React.lazy and Suspense, simulate latency, do exercises	Explain Suspense, guide latency simulation (Demo React.lazy(() => import()), show <Suspense>, guide latency practice)	
41	11.3 Avoiding lazy components 11.4 Exploring lazy pages and routes	Offline	CLO7	T, U	Slides, exercises	Discuss lazy pitfalls, demo route splitting	Slides, exercises		Apply lazy loading to routes, test performance	Review slides, assist with lazy route implementation (Discuss lazy pitfalls, demo route splitting)	
42	Client - Server Communication 12.1 Set up a simple server that makes data available for clients LAB 5: Routes & Lazy Loading	Offline	CLO7	I, T	Slides, lab questions	Explain JSON server, demo json-server --watch, guide setup Assist with Lab 5 completion	Slides, AI tool, lab 5 prompt		Set up JSON server, study client-server basics, complete Lab 5	Guide JSON server setup, demo communication, review Lab 5 tasks (Explain JSON server, demo json-server --watch, guide setup Assist with Lab 5 completion)	
43	Review Lab 5	Offline	CLO5, CLO7, CLO9	U	Lab submissions	Analyze routing with AI, review 10 students, provide optimization feedback	Lab solutions, AI tool, Lab 5's review table questions		Submit Lab 5, use AI to optimize routing, prepare for review	Use AI to check submissions, conduct 1-1 review for 10 students, provide feedback (Analyze routing with AI, review 10 students, provide optimization feedback)	
44	Review Lab 5 (td)	Offline	CLO5, CLO7, CLO9	U	Lab submissions	Analyze routing with AI, review 10 students, provide optimization feedback	Lab solutions, AI tool, Lab 5's review table questions		Submit Lab 5, use AI to optimize routing, prepare for review	Use AI to check submissions, conduct 1-1 review for 10 students, provide feedback (Analyze routing with AI, review 10 students, provide optimization feedback)	
45	12.2 Access the data from the server using a browser 12.3 Use the json-server as a simple static web server	Offline	CLO7	T, U	Slides	Demo browser fetch, guide data display, troubleshoot server issues	Slides		Fetch data from server, display in app, practice	Review slides, assist with data access (Demo browser fetch, guide data display, troubleshoot server issues)	
46	Fetching and Catching Data with React 13.1 When to fetch and store data in React. How to use window.fetch.	Offline	CLO7	I, T	Slides	Explain fetch timing, demo fetch(url), guide implementation	Slides		Study fetch, implement in app, practice	Introduce fetch, demo data fetching (Explain fetch timing, demo fetch(url), guide implementation)	

47	13.2 What promises are. How async/await works.	Offline	CLO7	T, U	Slides, exercises	Show async () => await fetch(), assist with exercises, explain promises	Slides, exercises		Use async/await with fetch, practice exercises	Review slides, guide async/await exercises (Show async () => await fetch(), assist with exercises, explain promises)	
48	13.3 Getting Data with Axios How to simplify network requests with Axios. LAB 6: Fetching Data	Offline	CLO7	T, U	Slides, lab questions	Demo axios.get(), explain migration steps, assist with Lab 6 tasks	Slides, AI tool, lab 6 prompt		Replace fetch with Axios, complete Lab 6	Introduce Axios, guide migration, review Lab 6 requirements (Demo axios.get(), explain migration steps, assist with Lab 6 tasks)	
49	Review Lab 6	Offline	CLO7, CLO9	U	Lab submissions	Check fetch logic with AI, review 10 students, suggest data handling improvements	Lab solutions, AI tool, Lab 6's review table questions		Submit Lab 6, use AI to refine fetch logic, prepare for review	Use AI to evaluate submissions, conduct 1-1 review for 10 students, provide feedback (Check fetch logic with AI, review 10 students, suggest data handling improvements)	
50	Review Lab 6 (td)	Offline	CLO7, CLO9	U	Lab submissions	Check fetch logic with AI, review 10 students, suggest data handling improvements	Lab solutions, AI tool, Lab 6's review table questions		Submit Lab 6, use AI to refine fetch logic, prepare for review	Use AI to evaluate submissions, conduct 1-1 review for 10 students, provide feedback (Check fetch logic with AI, review 10 students, suggest data handling improvements)	
51	Flow Architecture and Intrduction to Redux 14.1 Explain the Redux approach to implementing a variant of the Flow architecture.	Offline	CLO8	I, T	Slides	Present Redux flow, demo store setup, guide initial practice	Slides		Study Redux principles, set up basic store, practice	Introduce Redux, explain Flow architecture (Present Redux flow, demo store setup, guide initial practice)	
52	14.2 Install and Configure Redux.	Offline	CLO8	I, T	Slides	Show npm install redux, demo store config, assist with setup	Slides		Install Redux, configure store, practice	Guide Redux installation, demo configuration (Show npm install redux, demo store config, assist with setup)	
53	14.3 Define Redux Toolkit	Offline	CLO8, CLO9	T, U	Slides, AI tool	Show AI Prompt for Toolkit, demo configureStore, review student integrations	Slides, AI tool		Use GenAI to generate Redux Toolkit code, integrate into app, practice	Demo AI for Redux boilerplate, guide integration (Show AI Prompt for Toolkit, demo configureStore, review student integrations)	

54	Redux architecture 15.1 Split the reducer function into multiple simpler functions and combine the reducer functions 15.2 Use Redux Thunk middleware to return a function instead of an action	Offline	CLO8	T, U	Slides	Demo combineReducers, show Thunk async action, assist with exercises	Slides		Split reducers, implement Redux Thunk for async, practice	Explain reducer splitting, guide Thunk implementation (Demo combineReducers, show Thunk async action, assist with exercises)	
55	15.3 Use a logger middleware to print a log of actions initiated on the Redux store	Offline	CLO8	T, U	Slides	Demo redux-logger, explain log output, guide middleware integration	Slides		Add logger middleware, monitor actions, practice	Guide logger setup, demo action logging (Demo redux-logger, explain log output, guide middleware integration)	
56	Progress Test - 02	Offline	CLO7-CLO8 CLO1-CLO8	T, U	Test questions	Upload test to Exam website, monitor testing, grade submissions	Examination		Study materials, complete Progress Test 2	Administer test, evaluate submissions (Upload test to Exam website, monitor testing, grade submissions)	
57	Assignment Evaluate	Offline	CLO1-CLO9	U	Assignment submissions		Rubric, AI tool, Assginment's review table questions		Submit assignment, prepare for review with AI-optimized code	Use AI to pre-check submissions, conduct 1-1 review for 10 students, provide feedback	
58	Assignment Evaluate	Offline	CLO1-CLO9	U	Assignment submissions		Rubric, AI tool, Assginment's review table questions		Submit assignment, prepare for review with AI-optimized code	Use AI to pre-check submissions, conduct 1-1 review for 10 students, provide feedback	
59	Assignment Evaluate	Offline	CLO1-CLO9	U	Assignment submissions		Rubric, AI tool, Assginment's review table questions		Submit assignment, prepare for review with AI-optimized code	Use AI to pre-check submissions, conduct 1-1 review for 10 students, provide feedback	
60	Assignment Evaluate	Offline	CLO1-CLO9	U	Assignment submissions		Rubric, AI tool, Assginment's review table questions		Submit assignment, prepare for review with AI-optimized code	Use AI to pre-check submissions, conduct 1-1 review for 10 students, provide feedback	

0 Constructive question(s)

5 assessment(s)

Category	Type	Part	Weight	Completion Criteria	Duration	CLO	Question Type	No Question	Knowledge and Skill	Grading Guide	Note
Assignment	on-going	1	15.0%	>0	Guided in tutorials (Sessions 1), cont. at home	CLO1-CLO9	AI prompt, Likert review		Full-stack app using React, AI tools, covering CLO1-CLO9	Individual or team work, guided by instructor, submission by deadline	Introduced in Session 1, Evaluate in Session 57-60.

Labs	on-going	6	20.0%	>0	Guided and reviewed in tutorial sesions; Cont. at home	Lab 1: CLO1, CLO2, CLO3 Lab 2: CLO4 Lab 3: CLO2, CLO6 Lab 4: CLO6, CLO9 Lab 5: CLO5, CLO7 Lab 6: CLO7, CLO9	Practical exercises using AI prompt, Likert review		Lab 1: React setup, JSX Lab 2: Bootstrap UI Lab 3: Components, Events Lab 4: Hooks Lab 5: Routes, Lazy Loading Lab 6: Fetching data	Teachers support tutorials, students complete independently, 1-1 review for 10 students per Lab	Reviewed in Sessions 10, 19, 25, 34, 43, 49 using AI assistance (CLO9). Submission via EduNext.
Practical Exam	on-going	1	20.0%	4	85'	CLO1-CLO9	Preferable to be marked by scripts		Build React app with AI integration, covering CLO1-CLO9	Supervised by proctor(s) sent by exam board	
Progress test	on-going	2	15.0%	>0	30' each	PT 1 CLO1 - CLO6 PT 2 CLO7 - CLO8	Multiple choice or essay	20-25 (MCQ) or 5-8 (essay) per PT	PT 1: Fundamentals, Components, Hooks PT 2: Client-Server, Redux	Supervised by instructor, online or in-class	PT 1 in Session 36, PT 2 in Session 56, reviewed post-grading by instructor.
Final exam	Final exam	1	30.0%	4	60'	CLO1-CLO9	multiple choice	50	all topics; more than 70% new questions (for the current semester);	supervised by proctor(s) sent by exam board	