Testing Document

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1. Unit Testing

Test Case ID	Test Case Objective	Test Case Description	Expected Result
UT-01	Validate user registration function	Verify that the user registration function accepts valid inputs and creates a new user	User is successfully registered and stored in DB
UT-02	Validate password encryption	Check that user passwords are encrypted before storage	Passwords stored are hashed/encrypted, not plain text
UT-03	Validate course creation logic	Test course creation function with valid and invalid inputs	Course created for valid input, error for invalid
UT-04	Validate payment calculation	Test calculation of total payment including discounts and taxes	Correct total amount is calculated
UT-05	Validate video upload processing	Verify that video uploads trigger correct processing and storage path update	Uploaded video is stored correctly and accessible

2. API Testing

Test Case ID	Test Case Objective	Test Case Description	Expected Result
API-01	Test user login API	Send valid credentials to login API	API returns success status and JWT token
API-02	Test course list API	Request all available courses via API	API returns list of courses with correct details
API-03	Test enrollment API	Post enrollment request for a course	API returns confirmation of enrollment

API-04	Test payment processing API	Simulate payment process through API	API returns payment success or failure status
API-05	Test invalid authentication	Send requests with expired/invalid token	API returns unauthorized access error

3. Integration Testing

Test Case ID	Test Case Objective	Test Case Description	Expected Result
INT-01	Test frontend-backend integration	Verify data flow from UI forms to backend APIs during user registration	User data is correctly saved in backend database
INT-02	Test payment gateway integration	Verify backend correctly communicates with payment gateway APIs	Payment status is correctly received and processed
INT-03	Test notification service integration	Validate email notifications are sent after course enrollment	Email notification received by the user
INT-04	Test video streaming integration	Verify frontend fetches video content stored in blob storage	Videos play without errors
INT-05	Test real-time chat feature integration	Verify chat messages sent from frontend reach backend and broadcast to users	Messages are delivered in real time

4. System Testing

Test Case ID	Test Case Objective	Test Case Description	Expected Result
ST-01	End-to-end user registration	Register a new user, verify login, browse courses, and enroll	User completes all steps successfully
ST-02	Complete course purchase and access	Enroll in a paid course, complete payment, and access course materials	User can access purchased course content
ST-03	Test user roles and permissions	Verify access restrictions for student, instructor, and admin roles	Users have appropriate permissions based on role
ST-04	Test system performance under load	Simulate multiple users accessing courses simultaneously	System remains responsive and stable
ST-05	Verify system recovery after failure	Simulate server crash and recovery	System restores to last consistent state without data loss

5. Agile Testing

Test Case ID	Test Case Objective	Test Case Description	Expected Result
AG-01	Continuous Integration build verification	Verify code changes are integrated and builds successfully	Build passes with no errors or failed tests
AG-02	Automated regression test execution	Run automated regression tests on new builds	No critical regression bugs are introduced
AG-03	Sprint user story acceptance test	Validate that implemented user story features meet acceptance criteria	Features meet acceptance and pass all test cases
AG-04	Exploratory testing for new features	Conduct exploratory testing on newly developed features	Identify any unexpected behavior or bugs
AG-05	Usability testing during sprints	Gather user feedback on UI/UX during sprint demos	UI is intuitive and issues are logged for fixes