**1. User Roles & Authentication**

Your LMS will have different user roles, each with specific permissions.

**User Roles:**

* **Admin:**
  + Manage users (add, update, delete).
  + Create and assign courses to lecturers.
  + View reports and analytics.
  + Approve and moderate content.
* **Lecturer:**
  + Create, manage, and delete course materials.
  + Schedule Teams classes and provide links.
  + Assign and grade assessments.
  + Track student progress and performance.
* **Learner:**
  + Enroll in courses.
  + Access course materials.
  + Attend online classes via Teams links.
  + Submit assignments and take quizzes.
* **Support Staff:**
  + Assist students and lecturers with technical issues.
  + Moderate forums and discussions.
  + Manage helpdesk or support tickets.

**Authentication & Security:**

* Secure login using email/password with **MFA (Multi-Factor Authentication)**.
* Role-based access control (RBAC) to restrict permissions.
* Single Sign-On (SSO) with Microsoft or Google accounts.
* User session management to prevent unauthorized access.

**2. Course Management**

A structured way to create and manage courses for students.

**Features:**

* Create, edit, and delete courses.
* Categorize courses by subject, department, or difficulty level.
* Define course objectives, syllabus, and prerequisites.
* Assign multiple lecturers to a course.
* Manage enrollments (manual or automatic).
* Version control for course materials (updates without losing old content).

**3. Class Scheduling & Microsoft Teams Integration**

Integrate with **Microsoft Teams** for online classes.

**Features:**

* Schedule live classes with Microsoft Teams meeting links.
* Automated email/SMS notifications for upcoming classes.
* Calendar integration for students and lecturers.
* Attendance tracking (who attended vs. who missed).
* **On-Demand Recordings:** Store and access past lecture recordings.
* **Live Q&A and Chat Support:** Students can ask questions during live classes.

**4. Learning Materials Management**

Your system should support a variety of learning resources.

**Features:**

* Upload materials (PDFs, Word documents, PowerPoint presentations, images, audio files).
* Video embedding from **YouTube, Vimeo, or locally uploaded files**.
* **Interactive Content:** Add quizzes and discussions within materials.
* Rich text editor for course notes and descriptions.
* **Version Control:** Track changes and updates to learning materials.

**5. Assessments & Assignments**

Assessment tools to evaluate student progress.

**Features:**

* **Quiz Engine:**
  + Multiple-choice, true/false, and open-ended questions.
  + Timed quizzes and automatic grading.
* **Assignment Submission:**
  + Students upload documents (PDF, DOCX, ZIP files).
  + Auto-plagiarism check (via third-party APIs like Turnitin).
  + Deadline management and automated reminders.
* **Grading System:**
  + Manual and automatic grading.
  + Provide feedback on submissions.
  + Grade weight configurations (final exams, assignments, quizzes).

**6. Student Progress Tracking & Reports**

Monitor how students are performing.

**Features:**

* **Course Completion Tracking:**
  + Percentage-based completion indicators.
  + Certificates upon completion.
* **Performance Analytics:**
  + Quiz scores, assignment grades, and participation tracking.
  + Student ranking within a course.
* **Custom Reports:**
  + Instructor and student reports on performance.
  + Export reports as **PDF or Excel**.

**7. Communication & Support**

Enhancing student engagement and resolving issues.

**Features:**

* **Discussion Forums:**
  + Course-specific discussion boards.
  + Threads for questions and peer collaboration.
* **Live Chat & Support Tickets:**
  + Instant messaging with lecturers or support staff.
  + Ticketing system for technical issues.
* **Announcements & Notifications:**
  + Email and push notifications for assignments, exams, and course updates.

**8. Admin Dashboard**

A central panel for system administrators.

**Features:**

* **User Management:**
  + Create, edit, and deactivate users.
* **Course Management:**
  + Monitor active and archived courses.
* **System Monitoring:**
  + Track student engagement (logins, time spent on materials).
* **Analytics & Reports:**
  + Generate insights on student performance.
  + Identify at-risk students for early intervention.

**9. Technology Stack**

Choosing the right technology to build your LMS.

**Backend (ASP.NET Core with C#):**

* **Framework:** ASP.NET Core 7+
* **Database:** SQL Server or MySQL
* **Authentication:** Identity Server / OAuth 2.0 for SSO
* **APIs:** REST API for frontend integration
* **Integrations:**
  + **Microsoft Graph API** for Teams integration
  + **Azure Storage** for media files
  + **Turnitin API** for plagiarism checking

**Frontend:**

* **Option 1:** Razor Pages for a simple UI.
* **Option 2:** Blazor for a dynamic, interactive UI.
* **Option 3:** React.js or Angular for a modern SPA.

**Hosting & Deployment:**

* **Cloud Hosting:** Azure or AWS.
* **CI/CD Pipeline:** Automate deployments using GitHub Actions or Azure DevOps.

**10. Future Expansion**

Once your LMS is operational, consider these future enhancements:

* **Mobile App:** Native Android & iOS apps.
* **Gamification:** Leaderboards, badges, and achievements.
* **AI-powered Tutoring:** Chatbots to assist students.
* **Multilingual Support:** Expand accessibility for diverse users.

**Next Steps:**

Would you like a **system architecture diagram** or a **feature development roadmap**? I can also help you design the **database schema** or create a **prototype UI**.