Hardware Requirements

1. Servers:

Specifications: High-performance servers with a minimum of 16GB RAM, multi-core processors, and SSD storage for fast data retrieval and processing.

Quantity: At least two servers (one for development/testing and one for production), with the option to scale as the user base grows.

Cloud Alternatives: AWS, Google Cloud, or Azure virtual servers if in-house servers are not available or preferred.

2. Networking Hardware:

Requirements: Routers, switches, and load balancers to manage network traffic efficiently and provide consistent access to the platform.

Backup Systems: Redundant network infrastructure to ensure uninterrupted access in case of primary network failures.

3. Storage:

Requirements: SSD-based storage with RAID configurations for speed and data protection.

Cloud Storage Options: AWS S3 or Google Cloud Storage for secure, scalable storage of multimedia educational content.

4. Backup and Redundancy:

Data Backup Hardware: Local backup servers or a cloud-based backup solution for data protection and disaster recovery.

Uninterruptible Power Supply (UPS): Ensures servers remain online during power interruptions, safeguarding against unexpected shutdowns.

Software Requirements

1. Operating System:

Server OS: Linux distributions like Ubuntu Server or CentOS for server stability and security.

Development OS: Windows, macOS, or Linux, depending on developer preference and tooling compatibility.

2. Database Software:

Primary Database: MySQL or PostgreSQL for structured data storage, with NoSQL options like MongoDB for unstructured data.

Database Management Tools: Tools like phpMyAdmin or pgAdmin for managing and monitoring database operations.

3. Development Frameworks:

Front-End: React, Angular, or Vue.js for a dynamic and interactive user experience.

Back-End: Node.js, Django (Python), Ruby on Rails, or Laravel (PHP) for managing server-side logic and API creation.

4. Content Management System (optional):

CMS: Moodle or WordPress if extensive content management features are required for course materials and lesson planning.

5. Testing and Monitoring Tools:

Testing: Selenium, Jest, or Mocha for automated and unit testing.

Monitoring: New Relic or Prometheus for real-time performance tracking and troubleshooting.

6. Security Software:

SSL Certificates: Ensure encrypted communications and data protection.

Firewall and Antivirus: Essential for protecting against unauthorized access and malware.

7. Content Delivery Network (CDN):

CDN Providers: Cloudflare or AWS CloudFront to improve load times and content delivery globally.

Financial Requirements (Estimation)

1. Development Team Salaries:

Front-End and Back-End Developers: Estimated at $60,000 - $120,000 per year per developer, depending on experience.

UX/UI Designers: Estimated at $50,000 - $90,000 per year.

Project Manager: Estimated at $70,000 - $100,000 per year.

2. Cloud Hosting and Services:

Monthly Cloud Costs: Estimated at $500 - $2,000/month initially, depending on usage and services needed.

CDN: Estimated at $0.08 - $0.15 per GB (e.g., AWS CloudFront).

3. Software Licenses:

Design and Prototyping: Figma, Adobe XD (estimated at $12 - $50/month per user).

Testing Tools: Selenium (free) or alternatives; New Relic for monitoring (starting around $75/month).

4. Infrastructure and Hardware:

Initial Server Purchase: $2,000 - $5,000 per server (if not using cloud solutions).

Networking Hardware: Estimated at $1,500 - $3,000 depending on requirements.

5. Backup and Security:

Backup Solutions: Approximately $100 - $300 per month for cloud backup services.

Security Measures: SSL certificates ($50 - $150 per year), firewall and antivirus software (around $50 - $100 per month).