**3. Specific Requirements**

**Functional Requirements for AI Course Generation System**

**User Management and Authentication**

**FR-1: User Registration and Login**

* The system shall allow users to register with unique credentials (email, username, password)
* The system shall provide secure login functionality with password validation
* The system shall support password reset functionality via email verification

**FR-2: User Role Management**

* The system shall support two primary user roles: Creators and Learners
* The system shall allow Creators to upload, edit, and manage course content
* The system shall allow Learners to access courses, take quizzes, and view progress

**FR-3: User Profile Management**

* The system shall allow users to create and edit their profiles
* The system shall display user progress and achievement tracking
* The system shall maintain user preferences and settings

**AI-Powered Content Generation**

**FR-4: Document Upload and Processing**

* The system shall accept multiple file formats (PDF, DOCX, TXT, PPT) for course material upload
* The system shall process uploaded documents using natural language processing algorithms
* The system shall extract key concepts, topics, and learning objectives from uploaded content

**FR-5: Automated Lesson Generation**

* The system shall automatically generate structured lessons from uploaded documents
* The system shall organize content into logical learning modules with clear objectives
* The system shall create lesson summaries and learning outcomes for each generated lesson

**FR-6: AI Quiz Generation**

* The system shall automatically generate multiple choice questions from lesson content
* The system shall create true/false questions based on key facts and concepts
* The system shall produce short answer questions for comprehensive assessment
* The system shall ensure quiz questions align with lesson learning objectives

**FR-7: Flashcard Creation**

* The system shall automatically identify key terms and definitions from course content
* The system shall generate interactive flashcards for vocabulary and concept review
* The system shall organize flashcards by topic and difficulty level

**Content Management and Editing**

**FR-8: Content Review and Editing**

* The system shall allow Creators to preview AI-generated content before publishing
* The system shall provide editing tools to modify lessons, quizzes, and flashcards
* The system shall maintain version control for all content modifications

**FR-9: Course Organization**

* The system shall allow Creators to organize lessons into structured course modules
* The system shall support prerequisite management between lessons and modules
* The system shall enable custom sequencing of course content

**FR-10: Content Publishing**

* The system shall allow Creators to publish approved courses for Learner access
* The system shall support course status management (draft, review, published, archived)
* The system shall enable bulk publishing of multiple course components

**Learning and Assessment Features**

**FR-11: Course Navigation**

* The system shall provide intuitive navigation through course materials
* The system shall track learner progress through lessons and modules
* The system shall allow learners to bookmark and return to specific content

**FR-12: Quiz Taking and Assessment**

* The system shall present quizzes in an interactive, user-friendly interface
* The system shall provide immediate feedback on quiz responses
* The system shall calculate and display quiz scores and performance analytics

**FR-13: Flashcard Study Tools**

* The system shall provide interactive flashcard review functionality
* The system shall implement spaced repetition algorithms for effective memorization
* The system shall track flashcard mastery levels for individual learners

**Search and Organization**

**FR-14: Content Search**

* The system shall provide search functionality across all course materials
* The system shall allow filtering by content type (lessons, quizzes, flashcards)
* The system shall support keyword-based and topic-based search queries

**FR-15: Content Organization**

* The system shall allow organization of content by topic, difficulty, or custom categories
* The system shall provide tagging functionality for improved content discovery
* The system shall support creation of custom learning paths and playlists

**Collaboration and Sharing**

**FR-16: Multi-Creator Collaboration**

* The system shall support multiple Creators working on the same course project
* The system shall provide collaboration tools for content review and approval workflows
* The system shall maintain contributor tracking and permissions management

**FR-17: Version Control Integration**

* The system shall integrate with GitHub or similar repository systems for content versioning
* The system shall track all content changes and maintain revision history
* The system shall support branching and merging of collaborative content development

**Export and Sharing Capabilities**

**FR-18: Course Export**

* The system shall allow export of complete courses in PDF format
* The system shall maintain formatting and structure during export processes
* The system shall include all associated materials (quizzes, flashcards) in exports

**FR-19: Course Sharing**

* The system shall generate shareable links for published courses
* The system shall support public and private course sharing options
* The system shall allow external learners to access shared courses without registration

**Dashboard and Analytics**

**FR-20: Progress Tracking**

* The system shall display comprehensive learner progress across all enrolled courses
* The system shall show completion percentages for lessons, quizzes, and overall courses
* The system shall track time spent on different course components

**FR-21: Performance Analytics**

* The system shall generate detailed analytics on quiz performance and learning outcomes
* The system shall provide insights on learner engagement and content effectiveness
* The system shall display performance comparisons and improvement trends

**FR-22: Course Management Dashboard**

* The system shall provide Creators with comprehensive course management tools
* The system shall display learner enrollment and engagement statistics
* The system shall show content performance metrics and usage analytics

Each functional requirement should be testable, measurable, and directly support the key features outlined in your project description. These requirements focus on what the system must do rather than how it will be implemented, providing clear guidance for both development and testing phases.