Software Requirements Specification

AI-Powered Course Generation Platform

Course: CMSC 430 — Software Engineering

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# 1. Introduction

## 1.1 Purpose

This document defines the software requirements for an AI-powered course generation system that automatically creates educational content from uploaded notes or documents. It describes the system’s functionality, performance goals, constraints, and interfaces to guide design, development, and validation.

## 1.2 Scope

The system enables creators to upload study materials, from which AI generates structured lessons, quizzes, and flashcards. Learners can access and interact with these materials via a web interface. The system supports collaboration between multiple creators and offers dashboards for progress tracking and analytics.

## 1.3 Definitions, Acronyms, and Abbreviations

AI – Artificial Intelligence  
NLP – Natural Language Processing  
SRS – Software Requirements Specification  
API – Application Programming Interface

# 2. Overall Description

## 2.1 Product Perspective

The system is a web-based platform integrating AI capabilities to automate course material generation. It interacts with external AI APIs for natural language processing and quiz generation, and supports cloud-based storage for user data.

## 2.2 Product Functions

Key system functions include:  
- Upload and processing of source documents.  
- Automatic lesson, quiz, and flashcard generation.  
- Content review, editing, and publishing tools.  
- Learner interaction and progress tracking.  
- Collaboration and course management dashboards.

## 2.3 User Characteristics

There are two main user roles:  
- Creators: Upload, review, edit, and publish course materials.  
- Learners: Study lessons, take quizzes, and review flashcards.

## 2.4 Constraints

• The system must run on Windows or Linux servers.  
• Pre-existing libraries may be required for reading .ppt and .docx files.  
• The system must use a free AI model via an API.  
• Two-factor authentication is required.  
• The user interface must be straightforward and accessible.

## 2.5 Assumptions and Dependencies

• User has access to the internet.  
• User understands study content such as quizzes and flashcards.  
• Stable connection to the AI model.  
• Compliance with privacy regulations.  
• Features depend on access to a developer AI API.

# 3. Specific Requirements

## 3.1 Functional Requirements

The system must fulfill the following functional requirements:  
  
• User Registration, Login, and Role Management.  
• AI-based content extraction from uploaded files.  
• Lesson, quiz, and flashcard generation.  
• Content editing and publishing tools.  
• Learner progress tracking and analytics.  
• Course export and collaboration features.

## 3.2 Non-Functional Requirements

NFR-1: Process AI-generated lesson requests within 1 minute for standard-length documents.  
NFR-2: Support at least 10,000 concurrent users.  
NFR-3: Maintain 99.5% system uptime.  
NFR-4: Enforce strong password policies.  
NFR-5: Ensure responsive UI on all device types.  
NFR-6: Average page load time under 3 seconds.  
NFR-7: Full data recovery within 24 hours of critical failure.  
NFR-8: Feature updates should not exceed 1 hour downtime.  
NFR-9: Course export operations complete within 5 seconds.  
NFR-10: Maintainable setup environment within 1 day for new developers.

# 4. Appendices

This SRS follows the IEEE 830 standard for software documentation and may evolve as the project progresses.