

# Designing and Developing A Comprehensive Learning Management System

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**Abstract:** *This paper presents the design and development of a comprehensive Learning Management System (LMS) aimed at providing an integrated solution for education and training institutions. The proposed LMS seamlessly integrates a variety of critical features, including individual user logins, course enrollment, attendance tracking, learning pathways, assessments, evaluations, and certification management. The system is designed to offer a unified and intuitive centralized dashboard that allows educators and learners to efficiently manage and track their progress. The LMS enables personalized learning experiences through customizable learning pathways, real-time attendance monitoring, and effective assessment tools. Additionally, automated evaluation processes and certification management ensure that learners receive timely and accurate recognition for their achievements. This integrated approach to e-learning provides a streamlined, user-friendly platform that enhances both administrative efficiency and learner engagement, making it an ideal solution for modern educational environments.*

**Keywords:** Learning Management System, Role-based access control, Student Information System, JSON Web Token, HTTP, JWT, AI Driven

