Department of Information and Communication Technology Faculty of Technology

University of Ruhuna

System Requirements Specification

Database Management Systems Practicum

ICT 1222

Group No 12

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Introduction

Purpose

This document defines the requirements for a Student Management System for the Faculty of Technology. The system will manage student details, marks, attendance, and result management processes, facilitating efficient academic administration.

Scope

The TECMIS system helps to manage the registration and enrollment of students, course details, student marks, attendance medical submission. The system is in the admin, student, lecturers, and technical officer. Each of the users has specific authorities in the system mentioned below

- Student management, personal details, academic status, and attendance
- Mark and grade management, continuous assessments, mid exams, final exams
- Attendance management for theory and practical sessions
- Eligibility for the exams
- User roles and permissions for the admin, dean, lecturers, technical officers

Definitions, Acronyms, and Abbreviations

- CA - Continuous Assessment
- SGPA - Semester Grade Point Average
- CGPA - Cumulative Grade Point Average
- WH - Withheld
- MC - Medical Certificate

System Overview

System Perspective

This system overview serves as a foundation selection of the project documentation, offering stakeholders a concise understanding of TECLMS-TECMIS's purpose, components, key functionalities, and security considerations. It provides a high-level perspective before delving into more detailed sections of the project documentation. This will be a web-based application using MySQL as the database backend to store and manage academic data. The system will have a user-friendly interface, with role-based access for administrators, deans, lecturers, technical officers, and students.

User Characteristics

- Admin: Full access to all functionalities including user creation and system management with grant permissions
- Dean: Full access to manage student data, marks, attendance, and results, but without grant permissions
- Lecturer: Can manage marks and attendance for their respective courses but cannot create users
- Technical Officer: Can update and view attendance-related data
- Student: Read-only access to their final attendance, Courses, marks, and grades

System Specific Requirements

Functional Requirements

Functional Requirements of Admin

The Admin in a TECMIS system manages user accounts, controls system access, updates student and course records, and oversees academic data such as grades and attendance, ensuring smooth system functionality and maintaining the integrity of all institutional data.

- Admins can create, update, or delete accounts for administrators, lecturers, and staff.
- Admins are responsible for adding, editing, or removing student records.
- They can manage key academic records, including grades, transcripts, and attendance tracking.
- Admins can update course details, such as schedules, prerequisites, and descriptions.
- They can reset passwords and manage account access privileges.

Functional Requirements of Dean

The Dean in the system plays a crucial role in managing academic programs, overseeing faculty and student records, and ensuring compliance with educational standards. Their responsibilities, performance analysis, and supporting data-driven decision-making for institutional success.

- Review and authorize new academic programs, courses ensuring alignment with institutional goals.
- Regularly evaluate the effectiveness and outcomes of current academic programs using data analysis and feedback.
- Develop, update, and enforce academic policies and standards, ensuring compliance with regulatory requirements.
- Coordinate faculty assignments, balance staff workloads, and facilitate professional development opportunities.

Functional Requirements of Lecturer

In a TECMIS database management system, lectures are essential for fostering student interactions, managing courses effectively, and supporting various academic activities. They serve as a key platform for delivering content, encouraging engagement, and enhancing the overall educational process.

- Access and manage essential course details, including course syllabi, schedules, and learning materials.
- Manage student add, drop, and waitlist processes, ensuring seamless transitions.
- Assign and regularly update course content such as lectures, assignments, and reading materials.
- Generate detailed attendance reports to monitor student participation for the lectures.
- Monitor and oversee class rosters, tracking student enrollment to maintain accurate attendance and participation records.

Functional Requirements of Technical Officer

A Technical Officer ensures smooth operation, maintenance, and technical support. They troubleshoot issues, implement updates, and assist users, enhancing the system's overall efficiency and reliability.

- Manage and maintain the TECLMS-TECMIS database management system.
- Plan, schedule, and implement software updates, patches, and bug fixes.
- Provide technical assistance to administrators, faculty, and staff.
- Troubleshoot and resolve problems reported by users.
- Monitor and guarantee system availability and performance.

Functional Requirements of Student

In this system, students have limited administrative functions but require access to key features and information related to their academic journey, such as grades, course materials, and enrollment details.

- Access the system by logging in with personal credentials to ensure security.
- Check personal attendance records for each enrolled course.
- Browse and search for courses offered within the system.
- Retrieve comprehensive class schedules, including course dates, times, and locations

Non-Functional Requirements

There is more than one software requirement included in the non-function requirements of the TECLMS-TECMIS database management system which contains various processes, namely performance, security, usability, maintainability and compliance.

Performance

- The system should return search results (ex: marks, attendance)
- The system must support at least 100 simultaneous user requests
- The system should process data queries within 1 second during peak hours.

Security

- The system must enforce role-based and access control for different user groups
- User passwords should be stored using encryption techniques to protect against unauthorized access
- An audit log should record every modification to sensitive data (marks, attendance), capturing who made the change and when

Usability

- The interface must be simple and intuitive, allowing users to perform key tasks within three clicks
- The system should be accessible on desktop, mobile, and tablet devices
- Error messages should be user-friendly and guide users to resolve common issues.

Maintainability

- The codebase should be modular, allowing developers to update individual components without affecting the entire system
- The system should include detailed code documentation to facilitate easy maintenance by future developers
- System updates and patches should be possible without requiring complete downtime

Compliance

- User data should be anonymized where necessary to protect privacy
- Access to personal student information should be restricted to authorized roles only
- The system should adhere to data privacy laws such as the General Data Protection Regulation for student information

Data Model

ER Diagram

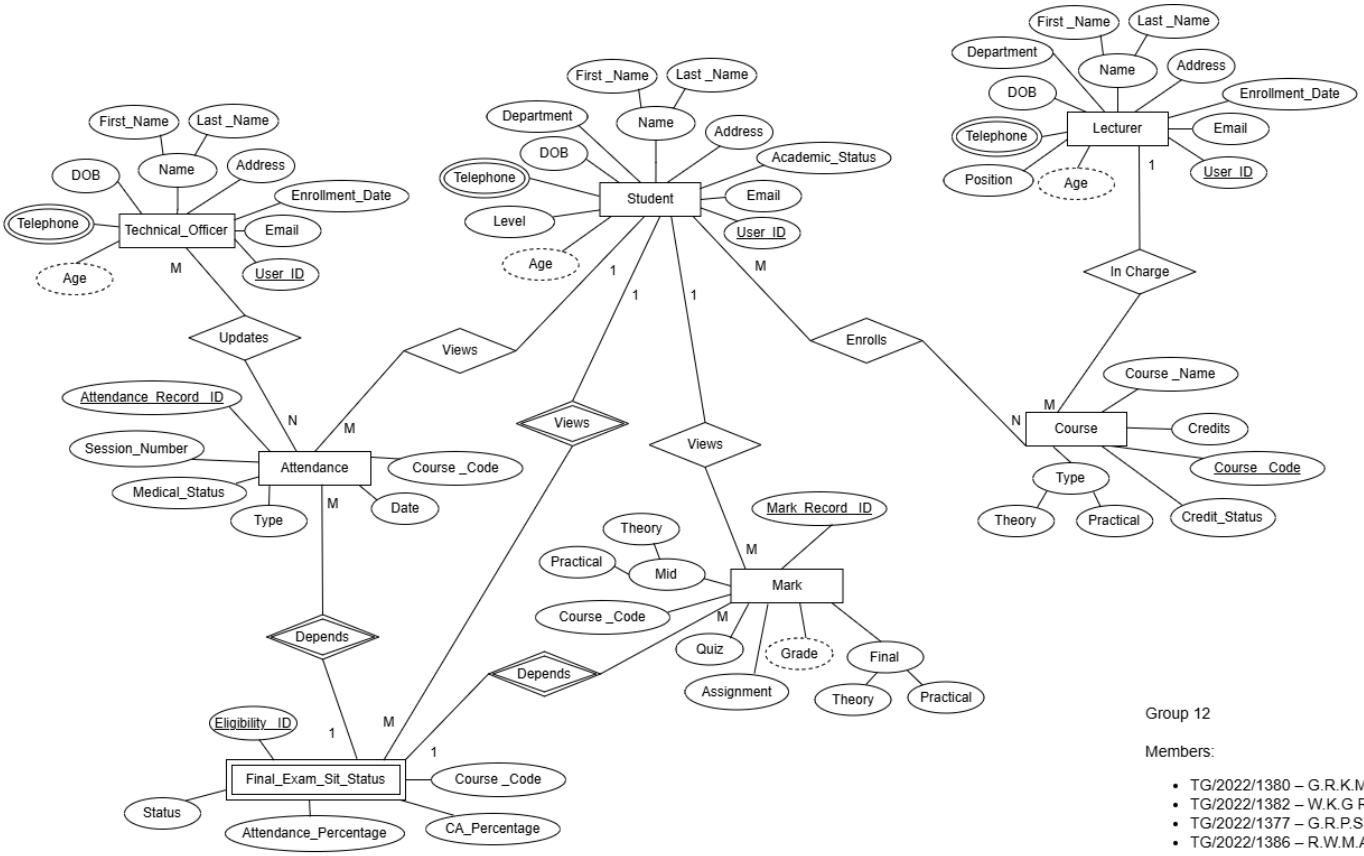

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Table Overview

The system will include several tables to store and manage data related to students, courses, attendance, marks, and user roles. Below is a brief description of each table.

- Users Table: To store admin, dean, lecturer, technical officers, and students
- Student Table: Contains basic student information (name, registration number, status)
- Course Table: Contains course details (code, name, credits, lecturer in charge)
- Attendance Table: Stores attendance for each session of each course
- Marks Table: Stores marks for quizzes, assessments, mid-semester, and final exams

References

TEC-LMS: Faculty Of Technology – University Of Ruhuna
http://teclms.ruh.ac.lk/

Handbook - University Of Ruhuna