



UGANDA CHRISTIAN
UNIVERSITY

A Centre of Excellence in the Heart of Africa

FACULTY OF ENGINEERING, DESIGN AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND TECHNOLOGY

EASTER 2025 SEMESTER EXAMINATION

PROGRAM: *BACHELOR OF SCIENCE IN COMPUTER SCIENCE*

YEAR: 2 SEMESTER: 2

COURSE CODE: *CSC2210*

COURSE NAME: *WEB PROGRAMMING*

EXAMINATION TYPE: *100% PROJECT-BASED EXAM*

PROJECT DURATION: APRIL 2025

TIME ALLOWED: *Two weeks Minimum*

Examination Instructions

1. The general Uganda Christian University examination guidelines and academic & financial policies apply to this examination. Violating any of the policies by the student automatically makes this examination attempt void, even if you have completed and submitted the answer booklet.
2. This exam consists of a project to be executed in *two* weeks.
 - a. Assessment of the project shall be based on five milestones, evaluated during the duration of the project. Each milestone shall be evaluated out of 20 marks.
 - b. At the end of the project, the following SHALL be submitted on Moodle.
 - i. A well-written project (Font: Trebuchet MS, 12Pts, 1.5 spacing, justified aligned), IEEE Referencing style.
3. Every student has a responsibility to prove their contribution towards every milestone, and marks may be awarded to every student individually.
4. Code Collaboration and Version Control: To facilitate collaboration and version control, students are required to use GitHub for this project.
 - i. Students should create a GitHub repository for their project and regularly push their code to the repository throughout the project duration, especially at the end of each milestone.
 - ii. Evidence of code commits and contributions on GitHub will be considered as part of the assessment for each milestone and the final project.

PART A:

PROJECT DESCRIPTION

PROJECT BACKGROUND

In today's fast-paced world, many parents face the challenge of balancing demanding work schedules with the need to provide nurturing care for their young children. This has led to a significant demand for reliable and professional daycare services. Daycare centers play a crucial role in supporting working parents by offering safe, structured, and engaging environments where children can receive supervision, care, and opportunities for socialization during the day. For parents, daycare centers provide peace of mind, knowing their children are in capable hands while they are at work or attending to other commitments. Beyond just supervision, quality daycare centers also contribute to early childhood development by providing stimulating activities and social interactions that are essential for a child's growth and well-being. Therefore, the effective management and operation of a daycare center are paramount to meeting the needs of both parents and children in the community.

PROJECT OVERVIEW

Daystar Daycare Center is envisioned as a premier facility dedicated to providing a secure, nurturing, and stimulating environment for young children. The center will operate under a well-defined management structure, with clearly assigned roles for a manager and babysitters. The manager will be central to the daily operations, responsible for overseeing all aspects of the daycare, from managing staff and children to handling finances and ensuring smooth daily routines. Babysitters will be entrusted with the direct care of the children, engaging them in age-appropriate activities, ensuring their safety and well-being, and providing a comforting and supportive presence. Efficient operation will be supported by a robust financial system that tracks income from parental payments, manages expenses including staff salaries and operational costs, and ensures sound budgeting practices. To streamline these operations and enhance overall efficiency, a software solution is proposed to automate key processes, improve communication, and provide data-driven insights for better management and decision-making.

FUNCTIONAL REQUIREMENTS

To effectively manage the operations of Daystar Daycare Center and meet the needs of parents and children, the software solution must incorporate the following functional requirements:

- 1. Babysitter Management:**

- a. Babysitter Registration:**

The system must facilitate the registration of babysitters, capturing the information below:

- (a) First name and last name
- (b) Email address (optional)
- (c) Phone number
- (d) National Identification Number (NIN)
- (e) Required age range validation (ensuring babysitters are between 21-35 years old)
- (f) Next of kin contact information

b. Babysitter Payment Management:

The system should automate the calculation and tracking of babysitter payments based on:

- (a) Payment per child per session (2,000K for half-day, 5,000K for full-day)
- (b) Number of children under their care
- (c) Session duration (half-day or full-day)
- (d) Generation of daily payment records for each babysitter, cleared by the manager.

c. Babysitter Scheduling and Attendance:

The system should enable the manager to:

- (a) Create and manage babysitter schedules.
- (b) Track babysitter attendance and session assignments.
- (c) Generate reports on babysitter schedules and attendance.

2. Child Management:

a. Child Registration:

The system must allow for the enrollment of children, recording critical details listed below:

- (a) Baby's full name
- (b) Age
- (c) Parent or guardian contact details (names, phone numbers, etc.)
- (d) Special care needs (allergies, medical conditions, dietary restrictions, etc.)
- (e) Duration of stay (half-day or full-day sessions)

b. Child Attendance Tracking:

The system should track child attendance for each session (half-day or full-day).

c. Incident Reporting:

Babysitters should be able to use the system to report any incidents or concerns regarding a child's health, behavior, or well-being to the manager.

3. Financial Management and Budgeting:

a. Income Tracking:

The system must track all income sources, including:

- (a) Parental payments for daycare services (full-day and half-day sessions)

b. Expense Tracking:

The system should monitor and record all operational expenses, such as:

- (a) Babysitter salaries
- (b) Procurement of toys and play materials
- (c) Center maintenance and repairs
- (d) Utility bills (electricity, water, etc.)

c. Budgeting and Financial Planning:

The system should enable the manager to:

- (a) Set and manage monthly or weekly budgets for various expense categories.
- (b) Track budget adherence and identify potential overspending.
- (c) Generate financial projections based on income and expense trends.

d. Financial Reporting:

The system must generate comprehensive financial reports, including:

- (a) Income vs. Expense Analysis: Reports comparing total income against total expenses over specified periods.
- (b) Budget Adherence Reports: Reports showing actual spending against budgeted amounts for different categories.
- (c) Spending Trend Analysis: Visual representations (graphs, charts) of spending trends over time and across categories.
- (d) Exportable Financial Summaries: Ability to export financial data in common formats (PDF, CSV) for review and external reporting.
- (e) Generating daily summaries of all financial transactions.

4. Notifications and Alerts:

a. Automated Notifications to Parents:

The system should automatically send notifications to parents regarding:

- (a) Child status updates (e.g., check-in, check-out, incident reports).
- (b) Payment reminders for daycare fees.
- (c) Overdue payment notifications.

b. Budget Threshold Alerts:

The system should generate automated alerts to the manager when:

- (a) Budget thresholds are exceeded for any expense category.

5. User Interface:

a. User-Friendly Interface:

The system must provide an intuitive and easy-to-use interface for all users (manager, babysitters) to manage daily activities efficiently.

NON-FUNCTIONAL REQUIREMENTS

1. Security:

- (a) **Data Protection:** All sensitive data, including personal information of babysitters and children, and financial records, must be securely stored and protected from unauthorized access.
- (b) **Secure Authentication:** Implement robust user authentication mechanisms (e.g., secure login protocols) to protect user accounts and prevent unauthorized system access.

2. Performance:

- (a) **Real-time Updates:** The system should provide real-time updates on financial data, attendance, and other operational information.
- (b) **Responsiveness:** The application should be responsive and efficient, with quick loading times and smooth transitions between different features.

3. Data Storage and Backup:

- (a) **Reliable Data Storage:** Utilize a reliable and scalable database system (e.g., MySQL, PostgreSQL) to ensure secure and efficient data storage.
- (b) **Data Backup and Recovery:** Implement a data backup strategy to prevent data loss and ensure quick recovery in case of system failures.

4. Scalability:

- (a) **Scalable Architecture:** The system architecture should be designed to handle a growing number of users, children, babysitters, and increasing volumes of data without performance degradation.

5. Reporting and Analytics:

- (a) **Customizable Reports:** The system should allow for the generation of customized reports based on different parameters and timeframes, providing flexibility in data analysis.
- (b) **Graphical Data Representation:** Utilize graphs and charts to visually represent financial data and operational trends for easier understanding and decision-making.

As Web Programming students, you are tasked with implementing a comprehensive software solution to support Day Star Daycare in their business operations. You are expected to leverage

the frameworks and technologies you have learned throughout your modules to build a fully functional application. Specifically, demonstrate your proficiency by utilizing appropriate frontend frameworks (React.js) and backend frameworks (Express.js) in your implementation. You are also encouraged to use a suitable database technology to manage the application's data.

Credit will be awarded to students who demonstrate strong implementation approaches, including well-structured designs, efficient workflows, and robust execution as displayed in PART B.

PART B: Project-based assessment guidelines

S/N	Milestone Description	Maximum Marks
1	MILESTONE ONE Focus on Conceptualization and Design to research, outline requirements, design system architecture, and explain design decisions.	20 %
2	MILESTONE TWO Focus on Core Functionality Implementation, implement user authentication and enrollment, applying programming principles.	20 %
3	MILESTONE THREE Focus on Advanced Feature Development, develop chapter president functionalities, analyzes data for trends, and integrates modules	20 %
4	MILESTONE FOUR Focus on Evaluation and Optimization, conduct system review, identify improvements, and present findings.	20 %
5	MILESTONE FIVE Focus on Creation and Documentation, create project documentation, synthesizes project aspects, and prepares a final presentation.	20 %
	TOTAL MARKS	100 %

~END OF EXAM GUIDELINES~