

06130T4CSC

COMPUTER SCIENCE LEVEL 6

ICT/OS/CS/CR/06/6/A

ICT/OS/CS/CR/06/6/B

Develop an Information System

July/August 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

PRACTICAL ASSESMENT

DURATION: TO RUN THROUGHOUT THE TRAINING

INSTRUCTIONS TO CANDIDATE:

1. You are required to perform the following tasks:
 - i. *Installation of Visual studio*
 - ii. *Set up the project and design the interface using the following controls*
 - iii. *Data Collection and Creating of the database and tables in MS SQL Server*
 - iv. *Application Logic*
2. You have been provided with the following resources:
 - i. *A working computer*
 - ii. *Internet Access*

Library Management System — Borrowing and Return Tracking

You are a software developer tasked with creating a Library Management System for a technical institute. The system should manage books, members, and borrowed items, and compute overdue charges. The librarian wants a system that not only stores book and member information but also calculates fines for overdue books and keeps borrowing activity records.

The Technical Institute allows students to borrow books for a maximum of 7 days. If a book is returned after the deadline, the student is fined Ksh. 10 per day for each day past the return date. The librarian also wants to track who issued the book, the time it was borrowed, and whether a book is currently available.

You are required to build a VB.NET application named "*SmartLibrarySystem*" to help manage this library.

Task 1: Installation of Visual studio

You are required to perform the following activities:

- i. Download Microsoft Visual Studio 2019
- ii. Install Microsoft Visual Studio 2019
- iii. Launch the installation

Task 2: Set up the project and design the interface using the following controls

- Create a new Windows Forms Application in VB.NET.
- Save and name the project as: "*SmartLibrarySystem*"

Book Management Form

- TextBoxes for:
 - Book ID
 - Book Title
 - Author
 - Quantity in stock
- Button to Add Book
- Button to View Available Books
- DataGridView to list all books and quantities

Member Registration Form

- TextBoxes for:
 - Admission Number

- Student Name
- Button to Register Member

Borrow Book Form

- ComboBoxes or Search fields to select:
 - Book Title
 - Member Admission Number
- Label or DateTimePicker to show:
 - Current Date
 - Expected Return Date (add 7 days)
- TextBox or Label for:
 - Name of Issuer
 - Time of Borrowing (auto-filled using system time)
- Button: Borrow Book
- Display error if book quantity is 0 or unavailable

Return Book Form

- TextBox for Admission Number or Book ID
- Auto-fetch and display:
 - Borrower Name
 - Book Title
 - Borrow Date
 - Return Deadline
 - Days Borrowed
 - Days Overdue
 - Fine Accumulated
- Button: Return Book
- Confirmation MessageBox on successful return

Task 3: Data Collection and Creating of the database and tables in MS SQL Server

Data collection

- Create a mock list of at least 5 books with titles, authors, and quantities.
- Create a list of at least 3 students with names and admission numbers.
- Populate the database with this data.

Database name: LibraryDB

Tables

i. Books

• Attributes

- BookID P
- Title should store 100 characters
- Author should store 100 characters

ii. Members

Attributes

- Admission No should store 20 characters
- Student Name should store 100 characters
- Borrowed Books
- Borrow ID
- BookID
- Issuer should store 100
- Borrow Date
- Return Date
- Time Borrowed
- Returned

Task 5: Application Logic

Control Structures

- Use If...Else to:
 - Check book availability before borrowing.
 - Check if a book has been returned late.
- Use loops to:
 - Display all borrowed books and calculate total fines.
 - Loop through overdue books and generate a report.
- Create a function to:

- Calculate the number of days between borrow date and current date.
- Calculate the fine based on days overdue.
- Return a status message (e.g., “On Time”, “Overdue”)
- Calculate and display
 - Number of days a book has been borrowed.
 - Number of days past the deadline.
 - The fine amount (Ksh. 10 per day overdue).
 - Average borrowing time per student