BACHELOROFCOMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-V

ASSIGNMENTS

(July-2025 & January-2026 sessions)

(BCS-051,BCS-052,BCS-053,BCS-054,BCS-055

BCSL-056, BCSL-057, BCSL-058)

SCHOOLOFCOMPUTERANDINFORMATIONSCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
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Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to BCA Programme Guide.
3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the BCA Programme Guide.

Course Code	**:**	**BCSL-057**
Course Title	**:**	**Web Programming Lab**
Assignment Number	**:**	**BCA(V)/L-057/Assignment/2025-26**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October,2025(For July, Session)**
		30th April, 2026(For January, Session)

Note: This assignment has one question for a total of 40 marks. The rest 10 marks are for viva voce. You must create the web application as specified, take screenshots of all pages and code, and attach them with your assignment.

Q1. Project: Community Library Management Website

You are required to design and implement a dynamic web application for a "Community Library". The website will allow users to browse available books and submit a request to borrow a book.

The website must consist of three pages, all following the layout shown in Figure 1.

Generated code

```
+-------------------------------------------------+
|                Top Division (Header)            |
|          [ Home ] [ Available Books ] [ Borrow ] |
+-------------------------------------------------+
|                                                 |
|                Information Division             |
|             (Content changes per page)          |
|                                                 |
|                                                 |
+-------------------------------------------------+
```

Figure 1: Layout of Web Pages

Part A: HTML, CSS, and Client-Side Scripting (20 Marks)

(i) Create Three HTML Pages:
Create three separate HTML files: index.html (Home), books.jsp (Available Books), and borrow.html (Borrow). All three pages must share the same layout as described in Figure 1, with a common Top Division for navigation.

(ii) CSS Styling:
Create an **external CSS file** (style.css) and link it to all three pages. This file should define the following styles:

- The Top Division should have a dark background color (#333) with white text for the navigation links.
- The Information Division should have a light grey background (#f4f4f4).
- The currently active navigation link should be highlighted (e.g., with a different background color or an underline).
- Use appropriate fonts, margins, and padding to make the layout clean and readable.

(iii) Home Page (index.html):
The Information Division of the Home page should display:

- A welcoming headline, e.g., "Welcome to the Community Library".
- A brief description of the library's mission and operating hours.
- An image of a library or books.

(iv) Borrow Page (borrow.html) and JavaScript Validation:
The Information Division of the Borrow page should contain a form for users to request a book. The form must include fields for:

- **Full Name** (Text input)
- **Email Address** (Email input)
- **Book ID** (Text input, referring to the ID from the "Available Books" page)
- **Borrow Date** (Date input)

Create a **JavaScript function** to validate this form on submission:

- All fields must not be empty.
- The Email Address must be in a valid format (e.g., contain '@' and '.').
- The Book ID must be a number.
- If validation fails, display an alert message and prevent the form from submitting.

Part B: JSP and Database Connectivity (20 Marks)

(v) Database Setup:
Create a database (e.g., in MySQL or Oracle) named library_db. Inside this database, create a table named books with the following schema:

- BookID (INT, Primary Key)
- Title (VARCHAR(100))
- Author (VARCHAR(100))
- Genre (VARCHAR(50))
- Status (VARCHAR(20), e.g., 'Available' or 'Borrowed')

Insert at least five sample records into the books table.

(vi) Available Books Page (books.jsp):
This page must be a **JSP page**. The Information Division should dynamically generate a table of all books from the library_db database.

- Use JSP scriptlets (<% ... %>) to connect to the database.
- Execute a SQL query to fetch all records from the books table.
- Use a loop to display the data in an HTML table with the columns: **Book ID, Title, Author, Genre, and Status**.
- Only books with the status 'Available' should have a green background color for the status cell. Books with 'Borrowed' status should have a red background.

(vii) Submission Handling (Optional, for higher marks):
(You are not required to write the full server-side code for processing the borrow form, but describing the logic is encouraged.) Briefly explain how you would create a JSP page (process_borrow.jsp) to handle the form submission

from borrow.html. The explanation should cover:

- Retrieving form data using request.getParameter().
- Connecting to the database.
- Updating the status of the requested book in the books table from 'Available' to 'Borrowed'.
- Displaying a success or failure message to the user.

Submission Checklist:

1. A report containing:
    - Screenshots of all three web pages (Home, Available Books, Borrow).
    - The complete code for index.html, borrow.html, books.jsp, and style.css.
    - The JavaScript validation code.
    - The SQL CREATE TABLE statement and INSERT statements for your database.
2. All source files should be included in the submission package.

Course Code	**:**	**BCSL-058**
Course Title	**:**	**Computer oriented Numerical techniques Lab**
Assignment Number	**:**	**BCA(V)/L-058/Assignment/2025-26**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October,2025(For July Session)**
		30th April,2026(For January Session)

This assignment has eight problems of 40 marks, each of 5 marks. All problems are compulsory. 10 marks are for viva voce. Please go through the guidelines regarding assignments given in the programme guide for the format of presentation.

Q1. Write a program in C that accepts a decimal number and displays its floating-point equivalent number. You may make assumptions to simplify the program, however, your representation of floating point number should be closer to IEEE 754 standard 32 bit representation.

(5 Marks)

Q2. Write a program in C to implement Regula-Falsi method. **(5 Marks)**

Q3. Write a program to implement Gauss Elimination method for solving linear equations. Your method should check if a given pivot is zero or not. It should also minimise the floating-point errors.

(5 Marks)

Q4. Write a program in C for the demonstration of Stirling's Formula for Interpolation. **(5 Marks)**

Q5. Write a C Program for solving the following system of equations using Jacobi method:

$$\begin{bmatrix} 5 & -1 & -1 & -1 \\ -1 & 10 & -1 & -1 \\ -1 & -1 & 5 & -1 \\ -1 & -1 & -1 & 10 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} -4 \\ 12 \\ 8 \\ 34 \end{bmatrix}$$

Starting with $x^{(0)} = (0, 0, 0, 0)$. The exact solution is $x = (1, 2, 3,4)\ T^n$. **(5 Marks)**

Q6. Write a C program to solve the IVP $y' = -ty^2$, $y(2) = 1$ and find $y(2.1)$ and $y(2.2)$ with $h = 0.1$ using improved tangent method (modified Euler method) of $O(h^2)$. **(5 Marks)**

Q7. Write a program in C to find the approximate value of the following definite integral using Trapezoidal rule and obtain a bound for the error. The exact value of $I = \ln_2 = 0.693147$ correct to six decimal places.:

(5 Marks)

$$\int_0^1 \frac{dx}{1+x}$$

Q8. Write a program in C to solve the equation $x^2y' = 1-xy-x^2y^2$, $y(1) =-1$ from x=1 to x=2 by using Taylor series method of $O(h^2)$ with h= 1/3 and ¼ and find the actual error at x=2 if the exact solution is y=-1/x .

(5 Marks)