

# **BACHELOR OF COMPUTER 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)**



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES  
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.

<b>Course Code</b>	:	<b>BCS-051</b>
<b>Course Title</b>	:	<b>Introduction to Software Engineering</b>
<b>Assignment Number</b>	:	<b>BCA(V)051/Assignment/2025-26</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>25%</b>
<b>Last Date of Submission</b>	:	<b>31<sup>st</sup>October,2025(For July, Session)</b> <b>30<sup>th</sup>April, 2026(For January, Session)</b>

**Note: This assignment has eight questions for a total of 80 marks. Answer all the questions. Each question carries 10 marks. The rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance explanations.**

**Q1.**

(a) Compare and contrast the **Waterfall Model** and the **Spiral Model** of software development based on the following criteria: **(5 Marks)**

- Risk Handling Capability
- Flexibility to accommodate changes
- Customer Involvement
- Suitability for large vs. small projects

(b) For which of the following scenarios would you choose the Spiral model over the Waterfall model? Justify your answer. **(5 Marks)**

- Scenario 1: Developing a simple inventory management system with well-understood requirements.
- Scenario 2: Developing a cutting-edge research prototype for an AI-based medical diagnosis tool where requirements are expected to evolve.

**Q2.** You are tasked with developing a "Hostel Management System" for a university. The system should manage student check-in/check-out, fee payments, room allocation, and mess billing.

Prepare a **Software Requirements Specification (SRS)** document for this system. Your SRS must include at least the following sections as per the IEEE 830 standard: **(10 Marks)**

- a. Introduction (Purpose, Scope, System Overview)
- b. Overall Description (Product Perspective, User Characteristics, Constraints)
- c. Specific Requirements (At least two Functional Requirements and two Non-Functional Requirements, e.g., performance, security).

**Q3.** For the "Hostel Management System" described in Q2, create the following **Data Flow Diagrams (DFDs)**: **(10 Marks)**

- (a) A **Context-Level (Level 0) DFD** showing the main system and its interactions with external entities (e.g., Student, Administrator, Accounts Department).
- (b) A **Level 1 DFD** that decomposes the main process from the Context-Level diagram into at least three major sub-processes (e.g., "Manage Student Registration," "Process Fee Payments," "Allocate Rooms").

**Q4.** A software project has been estimated to have 300 Function Points (FP). The project is being developed by a

team with average experience, and the complexity of the project is considered high. The company uses a productivity factor of 10 FP per person-month.

- (a) Calculate the estimated **effort** in person-months. **(3 Marks)**
- (b) If the project needs to be completed in 6 months, calculate the estimated **team size** (number of people required). **(3 Marks)**
- (c) Briefly explain what a "Function Point" represents in software estimation and why it is often preferred over Lines of Code (LOC) as a metric. **(4 Marks)**

**Q5.**

- (a) Differentiate between **Black-Box Testing** and **White-Box Testing**. Provide one example testing technique for each. **(5 Marks)**
- (b) Explain the hierarchy of software testing levels: **Unit Testing, Integration Testing, and System Testing**. Describe the primary goal of each level. **(5 Marks)**

**Q6.** Suppose a software application for online ticket booking has been successfully deployed. Describe a scenario that would necessitate each of the following types of software maintenance. **(2.5 Marks for each)**

- (a) **Corrective Maintenance**
- (b) **Adaptive Maintenance**
- (c) **Perfective Maintenance**
- (d) **Preventive Maintenance**

**Q7.** What is **Software Quality Assurance (SQA)**? Describe four key activities that a dedicated SQA team would perform during the software development lifecycle to ensure the final product meets the desired quality standards. **(10 Marks)**

**Q8.**

- (a) What is **Software Configuration Management (SCM)**? Explain its importance in a team-based software development environment. **(5 Marks)**
- (b) Define the following SCM concepts and explain their relationship:

- **Configuration Item (CI)** **(2 Marks)**
- **Baseline** **(2 Marks)**
- **Version Control** **(1 Marks)**