

# AG NIAZI UNIVERSITY SARGODHA

## Department of Computer Science

BS Computer Science (BSCS) — 4-Year Degree Program Outline

### Program Structure Overview

**Degree Duration:** 4 Years (8 Semesters) | **Total Courses:** 40+ Subjects | **Degree Focus:** Core Computing, Software Engineering, AI & Applied Data Science

### Semester 1

| #                  | Course Title                                             | Credit Hours |
|--------------------|----------------------------------------------------------|--------------|
| 1                  | Programming Fundamentals                                 | 3 + 1        |
| 2                  | Introduction to Information & Communication Technologies | 3 + 0        |
| 3                  | Calculus & Analytical Geometry                           | 3 + 0        |
| 4                  | English Composition & Comprehension                      | 3 + 0        |
| 5                  | Islamic Studies / Ethics                                 | 2 + 0        |
| 6                  | Pakistan Studies                                         | 2 + 0        |
| Total Credit Hours |                                                          | 16           |

### Semester 2

| #                  | Course Title                        | Credit Hours |
|--------------------|-------------------------------------|--------------|
| 1                  | Object-Oriented Programming         | 3 + 1        |
| 2                  | Digital Logic Design                | 3 + 1        |
| 3                  | Discrete Structures                 | 3 + 0        |
| 4                  | Linear Algebra                      | 3 + 0        |
| 5                  | Communication & Presentation Skills | 3 + 0        |
| Total Credit Hours |                                     | 17           |

### Semester 3

| #                  | Course Title                              | Credit Hours |
|--------------------|-------------------------------------------|--------------|
| 1                  | Data Structures & Algorithms              | 3 + 1        |
| 2                  | Computer Organization & Assembly Language | 3 + 1        |
| 3                  | Database Systems                          | 3 + 1        |
| 4                  | Probability & Statistics                  | 3 + 0        |
| 5                  | Technical & Business Writing              | 3 + 0        |
| Total Credit Hours |                                           | 18           |

### Semester 4

| #                  | Course Title            | Credit Hours |
|--------------------|-------------------------|--------------|
| 1                  | Operating Systems       | 3 + 1        |
| 2                  | Computer Networks       | 3 + 1        |
| 3                  | Software Engineering    | 3 + 0        |
| 4                  | Web Engineering         | 3 + 1        |
| 5                  | Artificial Intelligence | 3 + 0        |
| Total Credit Hours |                         | 19           |

### Semester 5

| #                  | Course Title                          | Credit Hours |
|--------------------|---------------------------------------|--------------|
| 1                  | Design & Analysis of Algorithms       | 3 + 0        |
| 2                  | Theory of Automata & Formal Languages | 3 + 0        |
| 3                  | Information Security                  | 3 + 0        |
| 4                  | Parallel & Distributed Computing      | 3 + 0        |
| 5                  | CS Elective-I                         | 3 + 0        |
| Total Credit Hours |                                       | 15           |

### Semester 6

| #                  | Course Title           | Credit Hours |
|--------------------|------------------------|--------------|
| 1                  | Compiler Construction  | 3 + 0        |
| 2                  | Machine Learning       | 3 + 1        |
| 3                  | Computer Graphics      | 3 + 0        |
| 4                  | Professional Practices | 3 + 0        |
| 5                  | CS Elective-II         | 3 + 0        |
| Total Credit Hours |                        | 16           |

### Semester 7

| #                  | Course Title                   | Credit Hours |
|--------------------|--------------------------------|--------------|
| 1                  | Final Year Project-I           | 0 + 3        |
| 2                  | Mobile Application Development | 3 + 0        |
| 3                  | Cloud Computing                | 3 + 0        |
| 4                  | CS Elective-III                | 3 + 0        |
| 5                  | University/General Elective    | 3 + 0        |
| Total Credit Hours |                                | 15           |

### Semester 8

| #                  | Course Title                      | Credit Hours |
|--------------------|-----------------------------------|--------------|
| 1                  | Final Year Project-II             | 0 + 3        |
| 2                  | Data Science / Big Data Analytics | 3 + 0        |
| 3                  | CS Elective-IV                    | 3 + 0        |
| 4                  | Entrepreneurship                  | 3 + 0        |
| 5                  | University/General Elective       | 3 + 0        |
| Total Credit Hours |                                   | 15           |