## Riphah International University

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## **Project Deliverable 03**

## **BSCS\_8 (A&B \_Spring 2025)**

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| Course Title: | Compiler Construction | | | | Course Code: | | CS4703 | Credit Hours: | 3 |
| Instructor: | Ms. Sidra Rani | | | | Program Name: | | BSCS | | |
| Semester: | 8 | Batch: |  | Section: | A & B | | Date: | **19 May, 2025** | |
| Due Date: | **24 May, 2025** | | | | Maximum Marks: | | |  | |
| Student’s Name: |  | | | | SAP-ID |  | | | |

### **Objective:**

### Design and implement a **Syntax Analyzer (Parser)** for the same language you used in the lexical–analysis phase. The parser must read the stream of tokens produced by your lexer, verify that they conform to the grammar of the language, and construct an appropriate intermediate representation (e.g., a parse tree).

#### **Deliverable Task Statement**

Develop a Syntax Analyzer that performs the following tasks:

1. **Read the token stream** generated by your lexical analyzer (either via a file or direct function call).
2. **Implement the context‑free grammar** of your language (BNF / EBNF form must be included in your report).
3. **Recognize valid constructs**—declarations, expressions, control statements, function definitions, etc.—according to the grammar.
4. **Build an intermediate representation(Parse Tree)**
5. **Detect and report syntax errors** with:
   * Line and column number (or token index)
   * Expected token(s) vs. token found
   * Brief description of the error  
     Graceful error‑recovery (e.g., panic‑mode using synchronizing tokens) should let parsing continue to find additional errors.
6. **Output requirements**
   * **Success case**: print “Parsing completed successfully” and optionally display / serialize the AST.
   * **Error case**: list each syntax error with its location and message.