BASIC PROGRAMMING LANGUAGE

SYLLABUS

1. **Subject Name: Basic Programming Language**
2. **Subject Code: SEM1-BPL**
3. **Class Hours: 42 hours**
4. **Pre-requisites:**
5. **Subject's Description:** This subject provides the basics of programming. Students will learn problem solving, building algorithms for programming problems. After that students continue to learn the basic skills of C programming such as variables, data types, operators, conditional statements, loops, arrays, functions, ...
6. **Purpose of Subject:**

   After finishing this subject, learners can archive:

   - Understand concept of computer program and algorithm
   - Understand variables, data types and operators
   - Understand condition statements
   - Understand loop statements
   - Understand array, string and pointer
   - Understand using functions
   - Understand using structs
   - Understand working with file

7. Learning Outcomes:

No.	Learning Outcome	Description of expected learning outcomes	LO Weight (100%)
1	G1	Understand concept of computer program and algorithm	15%
2	G2	Understand variables, data types and operators	10%
3	G3	Understand condition statements	10%
4	G4	Understand loop statements	15%
5	G5	Understand array, string and pointer	15%
6	G6	Understand using functions	20%
7	G7	Understand using structs	15%
8	G8	Understand working with file	10%

8. Subject Requirements

❖ **Student's learning attitudes:**

- Students should fully attend the class, participate in discussion during class, ensure the time for self-study to consolidate knowledge of the subject.
- Students need to seriously complete the test, assignment, final presentation/ projects with a confident, honest and creative attitude.
- Minimum participation accounting for 75% of the class hours is the prerequisite for the module evaluation.

❖ **Teaching and learning activities:**

- Instructor represents and organizes discussion sections in class. The Instructor must make sure to introduce 100% of the content of Lesson's Slides or Textbook provided by VTCA.
- The course has examinations and homework to train students' self-study ability and self-research before class, do group exercises to be able to apply their knowledge in analyzing and solving problems.

- The Instructor needs to emphasize real-life common problems/incidents realities and solutions/preventions and control.
- Instructors must focus on problem solving and building algorithms skills through flowcharts.

9. Subject's outline:

Abbreviations: Theoretical (T), Practical (P)

Lesson (Hour)	Type (T/P)	Lesson's Title	Lesson's Topic	Test
Lesson 1 (3 hours)	P	C Programming Language and Problem Solving	• Introduction to C Programming Language • C Program Structure • Basic Syntax • Problem Solving • Introduction to Algorithms • Use Symbols to Draw Flowchart	Lab 1
Lesson 2 (3 hours)	P	Variables, Data Types and Console Input/Output	• Introduction to Variable and Constant • Identifying Names • Different Between Variables and Constants • Data Types • Console Input / Ouput o Formated I/O: scanf(), printf() o Character I/O: getchar(), putchar()	Lab 2
Lesson 3 (3 hours)	P	Expressions, Operators and Type Casting	• Expression Definition • Operator Types: o Arithmetic Operator o Relational Operator o Logical Operator o Bitwise Operator	Lab 3

			○ Assignment Operator • Type Casting	
Lesson 4 (3 hours)	P	Decision Making Statements	• Concept of Decision Making Statements ○ if statement ○ if...else statement • Multi if statement • Nested if statement • switch...case statement ○ break statement	Lab 4
Lesson 5 (3 hours)	P	Loop Statements	• Concept of Loop Statements • for Statement • while Statement • do…while Statement • break and continue Statement • Nested Loop • Infinite Loop	Lab 5
Lesson 6 (3 hours)	P	Functions	• Top-Down Design • Function Introduction • Function Declaration and Calling • Arguments and Parameters • Return Statement • Variables/Functions Scope • Start Assignment	Lab 6

Lesson 7 (3 hours)	P	Arrays	• Introduction to Array • Explain Array Elements and Indices • Initialize Array • Introduction to Multi-dimensional Array • Single Dimensional Array Handling (Insert / Update / Display)	Lab 7
Lesson 8 (3 hours)	P	Strings	• String Concept • String Variables & Constants • String Input / Output o scanf(), printf() o gets(), puts() • String Functions o strcat(), strcmp(), strchr(), strcpy(), strlen()	Lab 8
Lesson 9 (3 hours)	P	Sorting and Searching Algorithms	• Introduction to Search and Search Algorithms • Searching Algorithms o Linear Search o Binary Search • Sorting Algorithms o Bubble Sort o Selection Sort	Lab 9
Lesson 10 (3 hours)	P	Pointers	• What are Pointers? • Pointer Variables and Operators • Pointer Arithmetic • Pointers and Single Dimensional Arrays	Lab 10

			• Pointer and Multidimensional Arrays • Dynamic Memory Allocation • Pointers and Functions	
Lesson 11 + 12 (6 hours)	P	User Defined Data Types	• Introduction to User Defined Data Types (struct) • Structure Variables Declaration and typedef Keyword • Accessing Elements in Structures • Passing Structure as Arguments to Functions • Arrays and Structures • Data Management with Array of Structures • Pointers and Structures	Lab 11 + 12
Lesson 13 (3 hours)	P	File Handling	• File I/O Concepts • Working with Streams o Text Stream o Binary Stream • I/O Functions: o open(), close() o fread(), fwrite(), fseek() o fscanf(), fprintf()	Lab 13
Lession 14 (3 hours)	P	Assignment Presentation	• Assignment Presentation • Explain Code and QA	Final Assignment

10. Student Assessment

Test	Weight (100%)	Description	Type of Assessment	Number of Questions/ Exercises/ Problems	Scope of Knowledge
Exercises	30%	Submit all correct exercises	Practice	All Exercises	Lesson 1-13
Final Assignment	70%	The final assignment requires all knowledge and problem-solving skills	Assignment	1 Assignment	Lesson 1-13

11. Teaching and Learning Materials

C Programming Book and Tutorials:

[1] C Programming Language, 2nd Edition - Brian W. Kernighan, Dennis M. Ritchie: https://www.amazon.com/Programming-Language-2nd-Brian-Kernighan/dp/0131103628

[2] Online C Programming Course: https://www.cprogramming.com

12. Change Control History:

Version	Date	Author	Description
1.0	18/20/2021	Vu Tran Lam	First Version

Head of Department	Author
HOANG VIET TAN	VU TRAN LAM