COURSE SYLLABUS

PROGRAMMING TECHNIQUES

Course code: 220037

1. General information:

Course type		Number of credits	Number of learning periods
General ☐ Basic ☑ Specialized ☐ Required ☑ Elective ☐		Theory: 02 Exercise: Practice: 01	Theory: 30 Exercise: Practice: 30

*Learners***:**

Level	Bachelor
Discipline	Information Technology

Course requirements:

Prerequisites	None
Parallels	None
Other requirements	None

2. Learning resources:

Books	[1] Phạm Văn Ất (2003). *Kỹ thuật lập trình C cơ sở và nâng cao.* NXB Thống Kê
References	[2] Trần Đan Thư (2003). *Giáo trình lập trình C tập 1-2*. NXB Đại học quốc gia TP. Hồ Chí Minh [3] Nguyễn Tấn Trần Minh Khang (2004). *Bài tập kỹ thuật lập trình C.* Đại học Khoa học tự nhiên Tp Hồ Chí Minh [4] Donald Ervin Knuth (2011). *The Art of Computer Programming*. Addison Wesley [5] Kernighan, B. W., & Ritchie, D. M. (1988). *The C programming*

language (Vol. 2). Englewood Cliffs, NJ: prentice-Hall		
Other learning materials	[6] Websites: 1. https://www.tutorialspoint.com/cprogramming/index.htm 2. https://www.learn-c.org/	

3. Course description:

The course provides students basic knowledge of computer programming techniques. The course also aims to provide opportunities to practice professional skills including problem analysis and programming to solve problems using C programming language with effective algorithms. Also, the course develops students' appropriate awareness and attitudes towards computer programming and teamwork skills.

4. Course learning outcomes (CLOs):

After finishing the course, students will be able to:

		Satisfy LOs of the program	*Satisfy LOs of the ABET*
❖ **Topic 1: Disciplinary Knowledge and Reasoning**			*B.1.1* *B.1.2* *B.1.3* *B.1.4* *B.1.5* *B.1.6*
L1.	Utilize methods of algorithm description to solve problems	*1.2.1*	
L2.	Utilize knowledge of programming languages to solve computer problems		
L3.	Use pointers, arrays, strings, and structures		
L4.	Utilize recursive programming techniques to solve problems		
L5.	Utilize Data file handling		
L6.	Utilize Error handling		
L7.	Verify the correctness of programs		
❖ *Topic 2: Personal and Professional Skills and Attributes*			
L8.	Problem Identification and Formulation	*2.1.1*	
L9.	Modeling	*2.1.2*	

L10.	Estimation and Qualitative Analysis	*2.1.3*
L11.	Survey of Print and Electronic Literature	*2.2.2*
L12.	Thinking Holistically	*2.3.1*
L13.	Creative Thinking	*2.4.3*
L14.	Ethics, Integrity and Social Responsibility	*2.5.1*
❖ *Topic 3: Interpersonal Skills: Teamwork and Communication*		
L15.	Technical and Multidisciplinary Teaming	*3.1.5*
L16.	Written Communication	*3.2.3*
L17.	Using English for Computer Science	*3.3.1*
❖ *Topic 4: Conceiving, Designing, Implementing and Operating Systems in The Enterprise, Societal and Environmental Context – The Innovation Process*		
L18.	Roles and Responsibility of IT Engineers	*4.1.1*
L19.	The Impact of IT Engineering on Society and the Environment	*4.1.2*
L20.	Understanding Needs and Setting Goals	*4.2.1*
L21.	Utilization of Knowledge in Design	*4.3.3*
L22.	Disciplinary Design	*4.3.4*
L23.	The Design Process Phasing and Approaches	*4.4.2*
L24.	Designing a Sustainable Implementation Process	*4.5.1*
L25.	Test, Verification, Validation and Certification	*4.5.2*

5. Course content:

Course content	CLOs	Number of learning periods		
		Theory	Practice	Others
Chapter 1. Overview of Computer Programming	*L1*	**03**	**05**	
1.1. Computer programming concepts				
1.1.1. Programming Concepts				
1.1.2. Programming Language Concepts				
1.1.3. Concept of Programs				
1.2. Overview of the algorithm				
1.2.1. Concept of the algorithm				
1.2.2. Properties of the algorithm				
1.3. Algorithms Representation				
1.3.1. Using natural language for expressing Algorithm				
1.3.2. Algorithm representation in pseudocode				
1.3.3. Algorithm representation with Flowchart				
1.3.4. Algorithm representation using programming languages				
☑ *Personal and Professional Skills and Attributes*	*L8(T); L9(T); L10(T);L11(U); L12(T); L13(I); L14(I)*			
☑ *Interpersonal Skills: Teamwork and Communication*	*L16(I); L17(I)*			
☑ *CDIO in the enterprise, societal and environmental context*	*L18(I); L19(I); L20(T)*			
Chapter 2. C Programming Language	*L2*	**05**	**10**	
2.1. The Components of a C Program				
2.1.1. Keywords and Identifiers				
2.1.2. Naming convetion				
2.1.3. Data type				

2.1.4. Variables, constants, assignments				
2.2. Operators and Expressions				
2.2.1. Expressions				
2.2.2. Operators				
2.3. Input/Output functions				
2.3.1. Command and command block				
2.3.2. Input functions				
2.3.3. Output functions				
2.4. Statmenet				
2.4.1. Selection Statements				
2.4.2 Iteration Statements				
☑ *Personal and Professional Skills and Attributes*	*L8(T); L9(T); L10(T); L11(U); L12(T); L13(I); L14(I)*			
☑ *Interpersonal Skills: Teamwork and Communication*	*L15(I); L16(I); L17(I)*			
☑ *CDIO in the enterprise, societal and environmental context*	*L20(T); L21(U); L22(T); L23(T); L24(T); L25(T)*			
Chapter 3. Functions	***L2, L6, L7***	**02**	**05**	
3.1. Define functions				
3.1.1. Concepts of functions				
3.1.2. Structure of functions				
3.1.3. Implement function				
3.2. Parameter passing				
3.2.1. Variable scope				
3.2.2. Passing by value				
3.2.3. Passing by reference				

☑ *Personal and Professional Skills and Attributes*	*L8(T); L9(T); L10(T); L11(U); L12(T); L13(I); L14(I)*			
☑ *Interpersonal Skills: Teamwork and Communication*	*L15(I); L16(I); L17(I)*			
☑ *CDIO in the enterprise, societal and environmental context*	*L20(T); L21(U); L22(T); L23(T); L24(T) L25(T)*			
Chapter 4. Arrays	*L2, L3, L6, L7*	**08**	**20**	
4.1. One dimensional array				
4.1.1. Concepts				
4.1.2. Declare and access				
4.1.3. Iteration				
4.1.4. Examples				
4.1.5. Parameter passing				
4.2. Two dimensional array				
4.2.1. Concepts				
4.2.2. Declare and access				
4.2.3. Iteration				
4.2.4. Examples				
4.2.5. Parameter passing				
4.3. Pointers and Dynamic memory allocation				
4.3.1. Pointer declaration				
4.3.2. Pointer operators				
4.3.3. Dynamic memory allocation				
4.3.4. Pointer and arrays				
☑ *Personal and Professional Skills and Attributes*	*L8(T); L9(T); L10(T); L11(U); L12(T); L13(I); L14(I)*			

☑ *Interpersonal Skills: Teamwork and Communication*	L15(I); L16(I); L17(I)			
☑ *CDIO in the enterprise, societal and environmental context*	L20(T); L21(U); L22(T); L23(T); L24(T) L25(T)			
Chapter 5. Recursive Programming Techniques	*L4, , L6, L7*	**04**	**05**	
5.1. Concept of recursive programming techniques				
5.2. Types of recursion				
5.2.1. Linear recursive				
5.2.2. Binary recursion				
5.2.3. Nonlinear recursion				
5.2.4. Mutual recursion				
5.3. Recursion problems				
5.3.1. Tower of Hanoi				
5.3.2. Fibonacci Sequence				
5.3.3. More examples				
5.4. Eliminating recursion				
☑ *Personal and Professional Skills and Attributes*	L8(T); L9(T); L10(T); L11(U); L12(T); L13(I); L14(I)			
☑ *Interpersonal Skills: Teamwork and Communication*	L15(I); L16(I); L17(I)			
☑ *CDIO in the enterprise, societal and environmental context*	L20(T); L21(U); L22(T); L23(T); L24(T); L25(T)			
Chapter 6. String and Structures	*L3, L6, L7*	**04**	**10**	
6.1. Declaring strings and operation on strings				
6.1.1. Concept				
6.1.2. Delare strings				
6.1.3. Operation on strings				

6.2. Structures				
6.2.1. Concepts				
6.2.2. Defining structures				
6.3. Declaring and accessing structures				
6.3. Declare structures				
6.3.2. Access structure members				
☑ *Personal and Professional Skills and Attributes*	*L8(T); L9(T); L10(T); L11(U); L12(T); L13(I); L14(I)*			
☑ *Interpersonal Skills: Teamwork and Communication*	*L15(I); L16(I); L17(I)*			
☑ *CDIO in the enterprise, societal and environmental context*	*L20(T); L21(U); L22(T); L23(T); L24(T) L25(T)*			
Chapter 7. Working with files	*L5, L6, L7*	**04**	**05**	
7.1. File concept, file types				
7.1.1. File concept				
7.1.2. Text file				
7.1.3. Binary files				
7.2. File operations				
7.2.1. Text file operations				
7.2.2. Binary file operations				
☑ *Personal and Professional Skills and Attributes*	*L8(T); L9(T); L10(T); L11(U); L12(T); L13(I); L14(I)*			
☑ *Interpersonal Skills: Teamwork and Communication*	*L15(I); L16(I); L17(I)*			
☑ *CDIO in the enterprise, societal and environmental context*	*L20(T); L21(U); L22(T); L23(T); L24(T); L25(T)*			
Summary of skills in course level				
☑ *Personal and Professional Skills and Attributes*	*L8(T); L9(T); L10(T); L11(U); L12(T); L13(I); L14(I)*			

☑ *Interpersonal Skills: Teamwork and Communication*	L15(I); L16(I); L17(I)	
☑ *CDIO in the enterprise, societal and environmental context*	L18(I); L19(I); L20(T); L21(U); L22(T); L23(T); L24(T); L25(T)	

6. Teaching and learning methods:

ID	Teaching method/technique		Description
M1.	Lecturing	☑	
M2.	Questions – Answers	☑	
M3.	Group-based Learning	☑	
M4.	Problem-based Learning	☐	
M5.	Project-based Learning	☑	
M6.	Case studies	☐	
M7.	Roleplay	☐	
M8.	Demo	☑	
M9.	Simulations	☐	
M10.	Debate	☐	
M11.	Game	☐	
M12.	Brainstorming	☐	
M13.	Think-Pair-Share	☐	

7. Course assessment:

ID	Assessment activity		Quantity	Weight	LOs assessed
T1.	Text-based midterm exam	☐			
T2.	Text-based final exam	☐			
T3.	Practice midterm exam	☑	01	25%	*L2, L3, L6, L7*
T4.	Practice final exam	☑	01	25%	*L3, L4, L5, L6, L7*

ID	Assessment activity		Quantity	Weight	LOs assessed
T5.	Report	☐			
T6.	In-class exercises	☐			
T7.	Homework assignments	☐			
T8.	Question – Answer	☐			
T9.	Term Project	☐			
T10.	Final Exam	☑	01	50%	*L1, L2, L3, L4, L5, L6, L7*
Formula for Overall score		*T3*0.25+T4*0.25+T10*0.5*			

8. Course requirements and expectations:

8.1. Requirements on attendance

- Students are responsible for attending in all classes. In case of absence due to force majeure circumstances, there must be sufficient and reasonable evidence.
- Students who do not attend more than 20% of the class sections, whether for reason or not, are deemed not to have completed the course and must re-enroll in the following semester.

8.2. Requirements and expectations on student behaviors

- Students must show their respects for teachers and other learners.
- Students must be on time. Students who are late more than five minutes will not be allowed to attend the class.
- Students should not make noise and interfere with others in the learning process.
- Students should not eat, chew gum, and use devices such as cell phones, music players during class hours.
- Laptops and tablets can only be used in class for the purpose of learning.
- Students who violate the above principles will be asked to leave the class and considered absent from the class.

8.3. Requirements on learning issues

Issues related to applying for score reservation, scoring complaints, scoring, exam disciplines are done according to the Learning Regulation of Tra Vinh University.

9. Tentative course instructor:

Vo Thanh C

DEAN   **DEPARTMENT HEAD**   **LECTURER**

Vo Thanh C