SOFTWARE ENGINEERING GRADUATION MODULE 1

1.Thông tin về học phần (General Information)

Tên học phần (Course name): **SOFTWARE ENGINEERING GRADUATION MODULE 1**

Mã học phần (Course code):

Số tín chỉ (Number of credits): 4

Loại học phần (Course type): Compulsory

Học phần tiên quyết (Prerequisites):

- Data structure and algorithm (INT13064)

Học phần trước (Previous courses):

Học phần song hành (Parallel courses):

Các yêu cầu đối với học phần (Course requirements):

- Lecture room: Projector, microphone and speaker, air conditioner.
- Laboratory: Computer with C/C++ or Java IDE, internet/intranet connection to submit

Giờ tín chỉ đối với các hoạt động (Teaching and Learning hours):

- Lectures (lí thuyết): 20h
- Exercises (bài tập): 0h
- Projects (bài tập lớn): 30h
- Lab (thực hành): 10h
- Individual reading (tự đọc): 0h

Địa chỉ Khoa/Bộ môn phụ trách học phần (Address of the Faculty/Department in charge of the course):

- Address: Faculty of Information Technology 1 - Posts and Telecommunications Institute of Technology, Km10, Nguyen Trai Street, Ha Dong District, Hanoi.
- Phone number: (024) 33510432

2. Mục tiêu học phần (Objectives)

Về kiến thức (Knowledge):

The aim of this course is to summarize the foundational knowledge of information technology subjects through programming, including:

- summary of algorithm knowledge through programming.
- summary of knowledge about data structures through programming.
- summary of knowledge about programming techniques through programming.

Kỹ năng (Skills):

The aim of this course is to equip learners with skills in:

- applying the foundational knowledge in solving specific problems of computer science.
- applying all the foundational programming techniques to solve specific problems of computer science.

Thái độ, Chuyên cần (Attitude):

Learners are required to attend the classes and complete assignments/projects.

3. Tóm tắt nội dung học phần (Description)

This course summarizes the entire knowledge of foundations of information technology through programming. Learners must have a solid knowledge of discrete mathematics, data structures, algorithms to solve problems. In addition, learners are also required to have good programming skills on different programming languages such as C, C ++, Java or Python to solve practical problems in computer sciences.

4. Nội dung chi tiết học phần (Outlines)

Chapter 1. Generation algorithm model

1.1. Introduction
1.2. Basic problems
1.3. Intermediate problems
1.4. Hard problems
1.5. Summarization

Chapter 2. Recursion algorithm model

2.1. Introduction
2.2. Basic problems
2.3. Intermediate problems
2.4. Hard problems
2.5. Summarization

Chapter 3. Backtracking algorithm model

3.1. Introduction
3.2. Basic problems
3.3. Intermediate problems
3.4. Hard problems
3.5. Summarization

Chapter 4. Greedy algorithm model

4.1. Introduction
4.2. Basic problems
4.3. Intermediate problems
4.4. Hard problems
4.5. Summarization

Chapter 5. Divide and conquer algorithm model

5.1. Introduction
5.2. Basic problems
5.3. Intermediate problems
5.4. Hard problems
5.5. Summarization

Chapter 6. Dynamic programming model

6.1. Introduction
6.2. Basic problems
6.3. Intermediate problems
6.4. Hard problems
6.5. Summarization

Chapter 7. Stack based programming

7.1. Introduction
7.2. Basic problems
7.3. Intermediate problems
7.4. Hard problems

7.5. Summarization

Chapter 8. Queue based programming

8.1. Introduction
8.2. Basic problems
8.3. Intermediate problems
8.4. Hard problems
8.5. Summarization

Chapter 9. Tree based programming

9.1. Introduction
9.2. Basic problems
9.3. Intermediate problems
9.4. Hard problems
9.5. Summarization

Chapter 10. Graph based programming

10.1. Introduction
10.2. Basic problems
10.3. Intermediate problems
10.4. Hard problems
10.5. Summarization

5. Học liệu (Textbooks)

5.1. Học liệu bắt buộc (Required Textbooks)

[1]. M. Main, W. Savitch, Data Structures and Other Objects Using C++ (4th Edition) 4th Edition, 2010.

[2]. Donald E. Knuth, "The Art of Programming", Addison-Wesley Publishing Company, 2005.

5.2. Học liệu tham khảo (Optional Textbooks)

[3]. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, 3rd Edition, the MIT Press, 2009.

[4]. Bradley N. Miller, "Problem Solving with Algorithms and Data Structures Using Python, 2nd Edition, 2011

6. Phương pháp, hình thức kiểm tra – đánh giá kết quả học tập học phần (Grading Policy)

Grading method	Percentage	Group/Individual
- Attendance	10%	Individual
- Exercises	10%	Individual
- Mid-term projects/exams	20%	Group or individual
- Final examination	60%	Individual

Trưởng Bộ môn
(Head of Department)

Nguyễn Mạnh Hùng

Giảng viên biên soạn
(Lecturer)

Nguyễn Duy Phương