

Course Outline 1/2022

CSX3001/ITX3001 Fundamentals of Computer Programming 1

Department of Computer Science
Department of Information Technology
Vincent Mary School of Science and Technology
Assumption University of Thailand

Course Status: **Major Required**

Number of Credit: **3**

	Section 541	Section 542	Section 543	Section 544
Class Schedule	Thursday 13:30 – 16:30		Monday 13:30 – 16:30	
Venue	VMS0203	VMS0204	VMS0203	VMS0204
Instructor	A. Pawut Satitsuksanoh	A. Thanachai Thumthawatworn	A. Thanachai Thumthawatworn	A. Pawut Satitsuksanoh
Office Location	VMS 507	VMS 505	VMS 505	VMS 507
E-mail Address	pawut@scitech.au.edu	thanachai@scitech.au.edu	thanachai@scitech.au.edu	pawut@scitech.au.edu
FB Contact	Pawut Satitsuksanoh	-	-	Pawut Satitsuksanoh

Objective

This course helps students to develop real-world problem-solving skills using computer programming. Students are introduced to the fundamentals of Python programming language with emphasis on primitive data types, basic control structures (conditions and loops), basic data structures (arrays), and functions. By the end of the semester, students will be able to solve programming problems that are the basic blocks for a bigger application development. Moreover, students are required to complete an assigned data analytics project.

Description

A study of the history of computer, the components of a computer system, coding and numbering systems, algorithm and development process of algorithms and expression of algorithms in terms of flowchart and pseudo code. The course also includes the implementation of algorithms using a high-level language that are used widely in the industry by emphasizing on the nature and structure of the language, techniques of programming for both numerical and non-numerical processing. Thus, students gain the knowledge of the structure of the programming languages and how to develop structured programming.

Class Regulations

- Be punctual. If you are late twice, it will be counted as one absence.
- **80% attendance is required to be eligible in taking the final examination.**
 - Student are allowed up to 13 hours of absence (or equivalent to **4 times of absence.**)
- Late in-class worksheets will not be accepted nor graded.
- Submission of copies/clones of programming exercises is considered as cheating.
 - All cheating cases will be reported to the department and actions will be taken seriously. Cheating includes copying work from classmates or the internet.
 - No credits will be given on any copies as well as the originals.

Mark Allocation

Class Participant, Assignments (worksheets)	20 percent
Quizzes, Term Project	15 percent
Codingbat.org (python)	5 percent
Midterm Examination (Practical & Paper-based)	20 percent
Final Examination (2 Practical Sessions, 20 percent each)	
Session 1: First online practical examination (to be announced).	40 percent
Session 2: Second online practical examination (to be announced).	

The above examination information is subject to changes due to Covid-19 situation

For each session, students are required to be and given practical questions. Python code and associated flowchart (draw by hand or any drawing tools and save as an image) shall be uploaded to MS Teams within an examination time period.

Total	100 percent
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Grading Student's code

- **Correctness**
 - Program should conform to specifications stated in the problem statement.
 - Program should demonstrate correct handling of special cases and error conditions.
 - Test data should include typical values, out-of-range values, boundary values, and special case values.
- **Style and Documentation**
 - Program should be easy to read and understand.
 - 4 Styles are in consideration;
 1. Indentation.
 2. Meaningful identifier names for functions and variables.
 3. Comment (method preconditions and postconditions).
 4. Use of "white space" (space and blank lines).

Content Outline

INTRODUCTION

- **Class #1: Hello Programming**
 - Code.org
 - Basic control structures
 - Flowchart
 - Number System

STRUCTURED PROGRAMMING

- **Class #2: Sequential Structure**
 - Basic coding
 - Expression evaluation (Operator precedence and associativity)
 - Inputting and outputting data
 - Data type, variable, and storage
 - Data conversion
- **Class #3: Conditional Control Structure**
 - Comparison operators
 - Boolean variable and operators
 - Using if-else / if-elif / if-elif-else statements
 - Nested if-else statements
 - Coding style, comments, and indentation
- **Class #4: Repetition Control Structure**
 - Conceptualizing loop structures
 - Scope of control and variables
 - Using while-loop (with else)
- **Class #5: cont. Repetition Control Structure**
 - Conceptualizing loop structures
 - Scope of control and variables
 - Using while-loop (with else)
- **Class #6: cont. Nested Loop Structure**
 - Conceptualizing nested loop structures
 - Using for-loop (with else) and range() function
 - Problem solving using complex control structure
 - Break and continue statement
- **Class #7: Understanding String**
 - Understanding the concept of strings
 - String operators and methods
 - Converting between Strings and other data types
 - Escape sequences
- **Practical Examination & Review**
 - Practical examination (2 hours)

MODULAR PROGRAMMING

- **Class #8 Lists in Python**
 - Lists manipulation in Python
 - Lists vs. arrays
- **Class #9 cont. Lists**
 - Removing/inserting list elements
 - List methods
- **Class #10 Modularization and Program Design**
 - Function (method)
 - Global variable
 - Pass by value / pass by reference
- **Class #11 cont. Modularization and Program Design (+ Recursion)**
 - Introduction to recursion
 - Recursive functions in Python
 - Term Project Assignment (deadline class #13)

SORTING AND SEARCHING ALGORITHM

- **Class #12 Searching Algorithms**
 - Introduction to searching and sorting
 - Basic searching and sorting algorithms
- **Class #13 Sorting Algorithms &**
 - Introduction to sorting
 - Sorting algorithms
- **Class #14 Practical Examination Session 1**
 - practical examination (3 hours)
- **Practical Examination Session 2**
 - practical examination (3 hours)