

**Course:** 06036023 BASIC DATA STRUCTURES AND ALGORITHMS  
**Credits:** 3(3-0-6)  
**Semester:** 1/2020  
**Instructor:** Sirasit Lochanachit ([sirasit@it.kmitl.ac.th](mailto:sirasit@it.kmitl.ac.th))  
**Lecture Room:** 434  
**Date & Time:** Tuesday 09:00 - 12:00

### Course Description

Data types; data structures and abstract data types; basic data structures; (e.g. list, stack and queue) dynamic data structures; terminology of trees; binary trees; binary search trees; AVL trees; graph; time and space analysis of programs; sorting and searching algorithms; greedy algorithm; divide-and-conquer algorithms; graph algorithms; and dynamic programming.

### Course Objectives

1. To introduce students to basic concepts and techniques in data structures and algorithms.
2. Be able to explain the basic concepts in data structures and algorithms.
3. Be able to analyse, apply and select data structures or algorithms appropriately for each application.

### Course Assessments

1. Individual Assignments: 20%
2. Group Presentations: 20%
3. Midterm Exam: 30%
4. Final Exam: 30%

### Grading

Planned grading criterias (subject to change)

Grade	Score (X)
A	$X \geq 80$
B+	$75 \leq X < 80$
B	$70 \leq X < 75$
C+	$65 \leq X < 70$
C	$60 \leq X < 65$
D+	$55 \leq X < 60$
D	$50 \leq X < 55$
F	$X < 50$

### Materials

- Goodrich, Michael T., Roberto Tamassia, and Michael H. Goldwasser. Data structures and algorithms in Python. John Wiley & Sons Ltd, 2013.
- Richard F. Gilbert and Behrouz A. Forouzan, Data Structures: A Pseudocode Approach with C, International Thomson Publishing, 1998.

## Lesson Plan

Week	Date	Topics	Individual Assignments	Group Presentations
1	4 Aug 2020	Introduction to Data Structures and Algorithms	-	-
2	11 Aug 2020	Arrays	#1	-
3	18 Aug 2020	Stacks	#2	Group #1
4	25 Aug 2020	Queues	#3	Group #2
5	1 Sep 2020	Linked Lists	#4	Group #3
6	8 Sep 2020	Trees	#5	Group #4
7	15 Sep 2020	Trees (Cont.)	-	Group #5
8		<b>Mid-term Exam</b>		
9	29 Sep 2020	Search Trees		-
10	6 Oct 2020	Search Trees (Cont.)	#6	-
11	13 Oct 2020	Graphs	#7	Group #6
12	20 Oct 2020	Hash Table	#8	Group #7
13	27 Oct 2020	Sorting and Searching	-	Group #8
14	3 Nov 2020	Sorting and Searching (Cont.)	#9	-
15	10 Nov 2020	Greedy and Divide-and-Conquer Algorithm	#10	Group #9
16	17 Nov 2020	Dynamic Programming	-	Group #10
17		<b>Final Exam</b>		