HANYANG UNIVERSITY
INTERNATIONAL SUMMER SCHOOL

*** Please fill out the form completely in English in detail.**

Name	Jongwook Woo
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Home University	California State University Los Angeles
Department	Computer Information Systems

Course Title	Data Structures & Algorithms
Field of Study	Data Structure, Basic object-oriented programming concept, abstract data format, stack, queue, heap, graph, search and alignment
Credits	3
Contact Hours	45
Course Code/Number	ITE2026 * In case it was opened at Hanyang University previously
Course Description	Data structures are essential elements for solving complex real problems using computers. Students learn mathematical methods to evaluate the performance of an algorithm for data structure and analyze time-and space-complexity of algorithms, identifying worst-case, average-case and best-case complexity. Students identify how to use data structures with a basic object-oriented programming concept, abstract data format, stack, queue, heap, graph, search and alignment with mathematical methods in time and space complexity. In this subject, specific implementations are learned with examples of various data structures written in Python or Java, an object-oriented language.
Course Objective	• Understand the basic concept of Data Structure • Understand the knowledge of data types, abstract data type, numbers, sequences, arrays and Linked Lists, trees, sets, maps, and graphs • Implement the solution of a practice problem sets and practice programming assignments • Identify the mathematical analysis of algorithm in Data Structure • Demonstrate knowledge of time and space complexity in Data Structure • Know worst-case, average-case and best-case complexity

Preparations (Pre-Knowledge)	a. Mastery over MS-Windows File Management (Windows Explorer) facilities. b. The course requires some prior knowledge of object-oriented programming (Python or Java), but not in data structures or algorithms c. Students are expected to attend every class session. Since Data Structure and Algorithm concepts are presented during class time, class attendance is essential for successful completion of assignments and tests. d. It is essential that Students utilize the time in class for discussion and exercises on the computer. e. Students are expected to use the equipment of the computer labs on campus if you do not have a personal computer nor internet.
Materials (Textbook/Websites link)	1. Instructional materials (Lecture and Lab) from the instructor 2. Python Tutorial, https://docs.python.org/3/tutorial/ 3. Introduction to Data Structures and Algorithms With Python, https://dev.to/collins42rono/introduction-to-data-structures-and-algorithms-with-python-1k0h 4. Data Structures and Algorithms in Python 1st Edition, ISBN-13: 978-1118290279 by Roberto Tamassia (Author), Michael H. Goldwasser (Author), Michael T. Goodrich

Lesson Plan: Fill out the topic for each class in detail		
Week 1	**1st Day**	**Orientation & Opening Ceremony**
	Class 1	Review of Object Oriented Programming
	Class 2	Review of Object Oriented Programming (Cont'd)
	Class 3	Basic Data Types, Notion of an Abstract Data Type
Week 2	**Class 4**	Numbers, Mathematical Properties of Sequences
	Class 5	Special Types of Sequences: Stacks, Heaps
	Class 6	Special Types of Sequences: Queues, Strings
	Class 7	Midterm Exam
Week 3	**Class 8**	Implementation of Sequence Type: Arrays
	Class 9	Implementation of Sequence Type: Linked Lists
	Class 10	Trees
	Class 11	Trees (Cont'd)

Week 4	**Class 12**	Sets, Maps
	Class 13	Graphs
	Class 14	Graphs and Search
	Class 15	Final Exam

Evaluation (%)

* Total sum of percentages should be 100%

* Only below options are available, please do not change the form (fill out the given form)

Assignments	Attendance	Final	Group Project	Mid-term	Participation	Presentation	Quiz	Total
30	10	35	0	25	0	0	0	**100 %**