



AMERICAN UNIVERSITY OF BEIRUT
MAROUN SEMAAN FACULTY OF ENGINEERING AND ARCHITECTURE

Introduction to Computation and Programming
EECE 230

1. Course Administration

Professor: Dr. Arij Daou

Office: RGB 405

Phone: x 3412

Office hours: **MW 12:00 – 1:30 am** (or by appointment).

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2. Course Description [3 credits]

This is an introductory programming course with an emphasis on abstractions and elementary algorithmic ideas. It uses the Python programming language. Topics include data types, selection, repetition, lists, tuples, strings, functions, files, exception handling, program efficiency, recursion, divide and conquer algorithms, recurrence relations, sorting and searching algorithms, binary search, merge sort, randomized quicksort, dictionaries, memoization, classes and object oriented programming, stacks and queues, applications, and selected topics. The course has a weekly lab.

3. Time and Place

MWF: 11:00 – 11:50

Place: Bechtel 109

4. Lab

Monday from 2:00 to 5:00 pm in SRB labs. Rooms: TBA

5. Textbook and Software

- Gutttag, John. *Introduction to Computation and Programming Using Python: With Application to Understanding Data, Second Edition*. MIT Press, 2016.
- Required software: **Python**

6. Student Assessment

Lab Assignments	10%
Quiz I	25%
Quiz II	25%
Final exam	40%



7. Moodle

Students are expected to check for updates on Moodle on a daily basis. Announcements, course handouts, and assignments will be available in “pdf” format from Moodle.

8. Course Objectives

The objectives of this course are to give students:

- An understanding of the principles of programming using Python.
- An understanding of elementary algorithms concepts including searching, sorting, recursion, and time analysis.
- An ability to write programs to solve simple engineering problems.

9. Course Topics

NUM	TOPICS COVERED
Unit I: Foundations	
1	Introduction to computation using Python, data types, selection, repetitions, and bisection method (<i>7 lectures</i>)
2	Lists, tuples, strings, and functions (<i>5 lectures</i>)
3	Files, exception handling, and plotting (<i>2.5 lectures</i>)
4	Introduction to program efficiency and asymptotic analysis, binary search, and insertion sort (<i>4 lectures</i>)
Unit II: Recursion, searching and sorting, recurrence relations, data structures, memorization	
5	Recursion: elementary examples, merge sort, divide and conquer algorithms, recurrence relations, recursion tree method (<i>6.5 lectures</i>)
6	Elementary data structures: two-dimensional lists, dictionaries, and stacks (<i>2 lectures</i>)
7	Applications: randomized quick sort, recursive enumeration, maze depth-first traversal (<i>3 lectures</i>)



NUM	TOPICS COVERED
Unit III: Object Oriented Programming with applications and selected topics	
8	Object Oriented Programming, classes, and inheritance (<i>3.5 lectures</i>)
9	Implementation of stacks and queues (<i>1.5 lectures</i>)
10	Graphs: representation, depth-first search, and breadth-first search (<i>2.5 lectures</i>)
11	Selected topics (<i>3.5 lectures</i>)

10. Educational Diversity

AUB strives to make learning experiences as accessible as possible. If you anticipate or experience academic barriers due to a disability (such as ADHD, learning difficulties, mental health conditions, chronic or temporary medical conditions), please inform the Accessible Education Office (AEO). In order to ensure that you receive the support you need and to facilitate a smooth accommodations process, you must register with the AEO as soon as possible. AEO's email address is accessibility@aub.edu.lb. The Office is located in West Hall room 318, and its AUB phone extension is 3246.