The Hebrew University of Jerusalem

Syllabus

INTRODUCTION TO COMPUTER SCIENCE - 67101

Last update 14-10-2020

<u>*HU Credits:*</u> *7*

<u>*Degree/Cycle:*</u> *1st degree (Bachelor)*

<u>*Responsible Department:*</u> *Computer Sciences*

<u>*Academic year:*</u> *0*

<u>*Semester:*</u> *1st and/or 2nd Semester*

<u>*Teaching Languages:*</u> *Hebrew*

<u>*Campus:*</u> *E. Safra*

<u>*Course/Module Coordinator:*</u> *Prof Aviv Zohar and Prof Jeffrey Rosenschein*

<u>*Coordinator Email:*</u> [*avivz@cs.huji.ac.il*](mailto:avivz@cs.huji.ac.il)

<u>*Coordinator Office Hours:*</u> *see on the course website*

<u>*Teaching Staff:*</u>

Prof Aviv Zohar,
Prof Jeff Rosenschein,
Dr. Arie Schlesinger,
Mr. Matan Levy,
Mr. Amir Guy,
Mr. Idan Refaeli,
Ms. Neta Kenneth,
Ms. Ayelet Mizrahi,
Ms. Liel Maruani,
Mr. Ziv Benaharon,
Ms. Adi Cogan

Course/Module description:
Familiarity with Computer Science: Programming Python language and recognition of selected topics in computer science.

Course/Module aims:
Design and realization of selected algorithms from computer science in the Python language.

Learning outcomes - On successful completion of this module, students should be able to:
Design and realization of selected algorithms from computer science in the Python language. Write complete programs in Python.

Attendance requirements(%):
There will be a shield grade awarded for presence in class, recitation, and labs

Teaching arrangement and method of instruction: Pre-recorded lectures, Synchronous lectures, recitations and labs

Course/Module Content:
1. functions, expressions, variables, types ,casting

2. Conditionals, Strings, parameter passing and return values

3. Loops (for, while), lists, slicing, debugging basics, nested lists/loops

4. Aliasing, scope, mutability, tuples, collections (set, dictionary), comprehension

5. Numeric algorithms, Runtime analysis (exponents, finding roots via binary search, sorting and more)

6. Recursion, run-time analysis of recursive functions O(nlogn sorting)

7. Object oriented programming

8. LinkedLists, trees.

9. Graphs, Exceptions.

10. Backtracking

11. 2nd order functions, closure, decorators

12. Event-driven programming, GUI

13. Generators, iterators, unit testing, assert

14. Advanced topics: Networking & Cloud deployment, Artificial intelligence: Chess playing. Turing Machines, Halting and Goedel.

Required Reading:
 NA

 Additional Reading Material:
 NA

 Course/Module evaluation:
 End of year written/oral examination 50 %
 Presentation 0 %
 Participation in Tutorials 0 %
 Project work 0 %
 Assignments 50 %
 Reports 0 %
 Research project 0 %
 Quizzes 0 %
 Other 0 %

Additional information:
 NA