East China Normal University
GEC International Summer School

CPP11: Introduction to Computer Programming

Term: June 17th to July 19th, 2024
Class Hours: Monday through Friday, 110 minutes each day (2,750 minutes in total)
Instructor: TBD
Home Institution: TBD
Office hours: TBD
Email: TBD

Course Description

This course will provide a comprehensive, fast-paced introduction to Python. Python is a language with a simple syntax, and a powerful set of libraries. It is an interpreted language, with a rich programming environment, including a robust debugger and profiler. While it is easy for beginners to learn, it is widely used in many scientific areas for data exploration.

The course emphasizes programming methodology, procedural abstraction, and in-depth study of data abstractions, as well as a structured lab component. It covers data types, control flow, object-oriented programming, and graphical user interface-driven applications.

Prerequisite: None

Learning Objective

Upon completion of this course, students should be able to:

1. To understand the nature of programming as human activity
2. To learn and experience main components of programming process
3. To understand main control structures of procedural programming languages
4. To learn and being able to use major programming patterns
5. To experience and use modern object-oriented programming paradigm
6. To understand the principles of data storage and manipulation

7. To get practical knowledge of a popular programming language Python

Required Text

Think Python, , second edition, by Allen B. Downey, O'Reilly, Sebastopol, California (available at http://www.greenteapress.com/thinkpython2/thinkpython2.pdf)

Course Hours

The course has 25 class sessions in total. Each class session is 110 minutes in length, for a total of 2750 minutes of in-class time. The course meets from Monday to Friday. ECNU awards 3 credits for this course. Different universities may count course credits differently. Consult officials at your own home institution.

Attendance

Summer school is very intense and to be successful, students need to attend *every class*. Occasionally, due to illness or other unavoidable circumstance, a student may need to miss a class. ECNU policy requires a medical certificate to be excused. Any absence may impact on the student's grade. Moreover, ECNU policy is that a student who has more than 3 absences will fail the course. Arriving late or leaving early will count as a partial absence.

Grading Policy

ECNU awards grades of A, A-, B+, B, B-, C+, C, D, and F. Most colleges and universities do not award transfer credit for grades of D or F.

In this course, grading will be based on the following:

Attendance/participation	10%
Assignments*3	5%*3=15%
Individual Project	15%
Midterm Exam	25%
Final Exam	35%

General Expectations

Students are expected to:

- Attend all classes and be responsible for all material covered in class and otherwise assigned. Any unexcused absence may impact a student's grade.
- Arrive to class on-time: Late arrivals are disruptive to your fellow students and to the conduct of the class.
- Complete the day's required reading and assignments before class
- Review the previous day's notes before class; make notes about questions you have about the previous class or the day's reading
- Refrain from texting, phoning or engaging in computer activities unrelated to class during class (不要用手机) It is highly disrespectful to the professor and to the class.
- Participate in class discussions and complete required written work on time.

Course Schedule

The planned schedule sketched out below may be modified to suit the interests or abilities of the enrolled students or to take advantage of special opportunities or events that may arise during the term.

Week 1

- *Day 1*
  - *Course outline*
  - *General Introduction*
- *Day 2*
  - *Basic idea of programming, algorithms, Python*
- *Day 3*
  - *Variables, expressions, data types and operators*
- *Day 4*
  - *Function calls, Math functions, flow of execution*
- *Day 5*
  - *Python lab day*

Week 2

- *Day 1*
  - *Turtle module, interface design, basic repetition*
- *Day 2*
  - *Conditional execution, alternative execution*
- *Day 3*
  - *Chained conditionals, nested conditionals, recursion*
- *Day 4*
  - *Return values, incremental development, composition, Boolean functions*
  - *Assignment 1 due*
- *Day 5*
  - *Python lab day*

Week 3

- *Day 1*
  - *Updating variables, while statement, break, iteration debugging*
- *Day 2*
  - *Strings, len(), traversal, string slices, searching, string methods*
- *Day 3*
  - *Lists, traversing, list operations, list slices, list methods*
- *Day 4*
  - *Midterm review session*
- *Day 5*
  - *Midterm exam*

Week 4

- *Day 1*
  - *Dictionary, looping and dictionaries, reverse lookup, memos*
- *Day 2*
  - *Tuples, tuples as return values, tuples and lists/dictionaries*
- *Day 3*
  - *Persistence, reading and writing, format operator, filename and path, exceptions*
  - *Assignment 2 due*
- *Day 4*
  - *Attributes, instance, pure functions*
- *Day 5*

    - *Python lab day*

Week 5

- *Day 1*
    - *(In)definite integrals, Fundamental Theorem of Calculus*
- *Day 2*
    - *Object-oriented features, printing objects, operator overloading, simple inheritance*
- *Day 3*
    - *Final review session*
- *Day 4*
    - *Final review session*
    - *Assignment 3 due*
- *Day 5*
    - *Final exam*

Academic Honesty

Students are expected to maintain high standards of academic honesty. Specifically, unless otherwise directed by the professor, students may not consult other students, books, notes, electronic devices or any other source, on examinations. Failure to abide by this may result in a zero on the examination, or even failure in the course.