Fall 2024

CS 106-101: Introduction to Computing

Trevor Summerfield

CS 106: Intro to Computing
Course Syllabus for Fall 2024 - Section 101

Instructor: Trevor Summerfield (trevor.summerfield@njit.edu)
Class Time: Mondays 6:00 PM - 9:05 PM, FENS 160

Course Description
An introduction to programming and problem solving skills for non-computing majors using Python programming languages. Topics include basic strategies for problem solving, constructs that control the flow execution of a program and the use of high level data types such as lists, strings, and dictionaries in problem representation. The course also presents an overview of selected "big idea" topics in computing.

Course Learning Outcomes
By the end of the course, students will be able to:

- Implement methods and apply parameter passing and return values when solving computational problems.
- Identify, apply, and differentiate between fundamental Python data types, including integers, floats, strings, booleans, and lists.
- Apply conditional/loop statements (e.g., if/elif/else, for loop, while loop) to control the program's flow of execution, producing different outcomes based on specific conditions or repetitions needed.
- Identify and apply the fundamental properties of strings in Python, including indexing, slicing, and string methods.
- Identify and apply list functions and operations to analyze and manipulate data collections.
- Design simple classes, instantiate objects and apply their methods to manipulate their attributes and achieve specific functionalities in a program.
- Identify various types of exceptions that can occur during program execution and utilize exception-handling techniques to address potential errors preemptively.
- Conduct research, evaluate sources, and communicate significant concepts related to Big Ideas in Computing.

Computing is a profession that requires lifelong learning, which is pursued through activities and using types of materials that are similar to those employed by students. In this course, the student, in addition to mastering the programming and problem solving materials, is expected to learn to effectively use learning strategies and materials — learning how to learn efficiently in preparation for a knowledge intensive profession. This includes effective use of knowledge resources — reading documentation, asking and answering peer questions, consulting with more experienced persons, and searching on-line for answers. It also includes tools and methodology — testing to verify the correctness of code, use of an integrated development environment (IDE) and debugger, writing specifications and documentation.

Learning this material requires extensive hands-on practice. You should plan to spend *twice* as much time studying and working problems outside of class (that is, about 6 hours per week) as you do in class.

Course Resources
The textbook is *Think Python* by Allen B. Downey, 2nd edition. This is an open source book. It is available without charge in HTML and PDF formats at http://greenteapress.com/wp/think-python-2e/. Please note that we are using the 2nd edition, not the 1st *or* 3rd edition.

A print format is published by O'Reilly (campus bookstore or online). There is also a Kindle edition. The textbook is required. You may use any one (or more) of the formats.

Other course materials:

- Thonny IDE, downloadable from thonny.org. In class, we will use Thonny, and it is recommended.
- Python language version 3.12 can be obtained at python.org/downloads. This includes the IDLE development environment, help files, modules and other parts of the standard distribution.

Class Attendance
Class attendance is mandatory. A student who misses more than five classes will be dropped, without credit. Getting to class late or leaving early counts as half an absence.

Homework
Homework must be submitted through Canvas on or before the due date and time. It will not be accepted late except for special circumstances (such as jury duty or medical problem), for which you must provide documentation.

A homework assignment will typically require you to write code that produces a specified output. No credit will be given for code that does not run. Getting a correct solution will often require that your solution be written, tested, and then rewritten multiple times until it fulfills the specification. Expect that the bulk of your time will be spent getting it right. Remember: only code that is correct is worth anything. During the write-test-debug cycle you may — and are encouraged to — use the debugging facilities in the development environment, pose questions on Canvas, and discuss the problem with others, however, you may **not** discuss solutions or share code with others.

Class Participation
Presenting your homework answers and presenting your projects in class is a regular part of the course. Asking and answering questions, taking quizzes, solving programming problems — individually or in groups — is a regular part of class meetings.

Cell phones must be turned off during class. During class time you may not play games, text, email, browse the web or engage in other activities that are not part of the class. Repeated infractions will be counted as half an absence.

Course Communication
Canvas (canvas.njit.edu) will be used to post lecture notes, to submit homework and for course discussion. You may also email instructors and classroom assistants.

Collaboration and Individual Responsibility
You are encouraged to study and to work on assignments together with others; collaboration is a basic learning technique. You may not take credit for the work of others. You must understand and be able to explain all the work that you submit.

Generative AI
This course expects students to work without artificial intelligence (AI) assistance in order to better develop their skills in this content area. As such, AI usage is not permitted throughout this course under any circumstance.

What You Will Learn
By the end of this course, you will be expected to know and be able to use these pieces of the computing toolkit to compute the solution of a specified problem:

- Devise a problem representation (model) and a sequence of steps (algorithm) that correctly solve the problem posed
- Write a program that implements the algorithm, using
- A core set of Python language elements (keywords, syntax, variables, modules)

- Basic data types (integers, floats, strings, booleans, lists, tuples, dictionaries) and operations on them
- Statements that perform console/file input and output
- Statements that control the sequence of execution (if/else, for, while)
- Statements that are structured into function calls

Each homework assignment gives you practice on these concepts and skills, and provides feedback on your progress. You are expected to submit working solutions to every homework assignment. Each element of this course builds on previous material, and any gaps in your understanding will compromise your ability to successfully complete the course. You understand material when you are able to use it to solve problems and to explain your solutions. The midterm and final exams test your mastery of the material.

Topics to Be Covered
The list of topics to be covered includes the following:

- Getting Started with Python
- Expressions, Variables, and Assignments
- Built-in Data Types
- Sequence Data Types (Strings, Tuples, and Lists)
- Python Standard Library
- Formatted Output and User Input
- Conditional Execution and Boolean Logic
- Iteration
- Functions
- Argument-Passing and Return Values
- Dictionaries

Overall Course Score Formula

Homework	20%
Attendance	5%
Midterm Exam	25%
Final Exam	35%
Quizzes	12%
Discretionary	3%

The letter grade is based on the overall course score.

Grade Formula						
Grade	**A**	**B +**	**B**	**C+**	**C**	**D**
Overall Course Score Cutoff	90	85	80	75	70	60

Exams
The midterm exam will take place on **Oct 28, 2024**. The final exams period is **December 15-21**. The CS106 final exam will be during this period, but the date has not yet been set. Be sure that you will be present for all of your exams.

You must bring ID to all exams. Students with special needs are advised to make arrangements with the Office of Accessibility Resources and Services, Kupfrian Hall 201.

There are no makeup exams. If you miss a midterm because of a documented special circumstance determined by the Dean of Students you may receive an imputed grade based on the other midterm and the final exam.

Tutoring:
YWCC and its ACM student chapter have partnered to create an online tutoring program available to students looking for tutoring assistance.

Requesting Accommodations:
The Office of Accessibility Resources and Services works in partnership with administrators, faculty, and staff to provide reasonable accommodations and support services for students with disabilities who have provided their office with medical documentation to receive services.

If you are in need of accommodations due to a disability, please contact the Office of Accessibility Resources and Services to discuss your specific needs.

Grade Appeals
If you believe that you deserve more credit than you have been awarded on a particular common exam problem, you may request, **at the time the exam is returned**, that it be re-graded. Your entire exam will be regraded, which may result in points being added or subtracted.

If you believe that you deserve more credit than you have been awarded on a particular homework problem, you may request, **within 48 hours of the grade being posted**, that it be regraded. Your entire homework will be regraded, which may result in points being added or subtracted.

University Code on Academic Integrity
Read the University Code on Academic Integrity (njit.edu/policies/sites/policies/files/academic-integrity-code.pdf). It describes infractions of academic integrity and penalties for violations, including, for the most serious violations, an XF grade in the course or expulsion. All work that you represent as your own must, in fact, be your own. Work done by others must be given proper credit.

You will be informed of any modifications of this syllabus during the semester.