CSci 127: Introduction to Computer Science
Hunter College, City University of New York
Spring 2020

This course presents an overview of computer science (CS) with an emphasis on problem-solving and computational thinking through 'coding': computer programming for beginners. Other topics include: organization of hardware, software, and how information is structured on contemporary computing devices. This course is pre-requisite to several introductory core courses in the CS Major. The course is also required for the CS minor. MATH 12500 or higher is strongly recommended as a co-req for intended Majors.

Course Designers:

- Dr. Katherine St. John
- Dr. William Sakas
- Prof. Eric Schweitzer

Course Instructors:

- Dr. Tiziana Ligorio (office hours)
- Katherine Howitt, adjunct lecturer

IMPORTANT:

The course has **lecture on Tuesday mornings** and **required weekly quizzes & code reviews in Lab 1001E** (see lab hours below and your Blackboard account for scheduling information).
This is a HYBRID course which means that **you are responsible for independently reading the weekly Lab** found in the "Handouts" column in the Course Outline below.
Starting February 6, **there is a programming assignment due EVERY DAY**. Programming Assignments are directly related to Labs and Lectures.
Lecture notes will also be posted weekly in the "Handouts" column in Course Outline below.

Lecture: Tuesday 9:45-11:00 118 HN Assembly Hall

Lab Hours: There is a dedicated computer laboratory, North 1001E for this course:

- Staffed Hours: Monday-Friday, 11am to 6:30pm, when classes are in session.
- Reservation link available on Blackboard on the left sidebar.
- Holiday, Lab Schedule and Program Due Dates (grid format; more details in the list format below)
- Undergraduate Teaching Assistants

Useful Links:

- Syllabus
- Programming Assignments
- Quiz & Code Review Topics and Deadlines

- ASCII Table
- Book & tutorial pages:
  - Python: How to Think Like a Computer Scientist by Miller *et al*.
  - Logical Circuits: Burch's Logic & Circuits, Explain Logic Gates
  - Machine Language: U Idaho reference sheet, MIPS Wikibooks
  - C++: Cplusplus Tutorial, C++ Tutorials Point, The Rook's Guide to C++

Course Outline:

Week:		Topics:	Handouts:	Quiz & Code Review:	Reading:
#1	Lecture: 28 January	Syllabus & Class Policies, Introductions, Introduction to Python: definite loops, simple output, primitive data types, overview of objects & modules; What is an algorithm?	Syllabus, Programming Assignments, Hello, World, Hexagon example, Fancier hexagon, Lecture Notes		Think CS: Chapter 1 & Chapter 4
	Lab & Quiz: 28-31 January, 3 February	Getting started with Python & IDLE; Using modules and definite loops	Lab 1	Academic Integrity	
#2	Lecture: 4 February	Strings & Lists: looping through strings, console I/O, ASCII representation CS Survey: Prof. William Sakas (computational linguistics)	Loop Puzzle 1, Loop Puzzles 2, Caesar Cipher example, input() example, Lecture notes		Think CS: Chapter 2 & Chapter 3
	Lab, Quiz, & Code Review: 4-10 February	String methods; Problem solving and the design process (simple parsing and translating)	Lab 2	Loops & Turtles	
#3	Lecture: 11 February	Arithmetic; Indexing & Slicing; Colors, Hexadecimal notation; Prof. John Ranellucci, Educational Psychology	Event Timing (Arithmetic Challenge), Slicing Challenges, Color Challenges, Lecture notes		Think CS: Section 8.11 & Chapter 11, Numpy tutorial (DataCamp)
	Lab, Quiz, & Code Review: 11-14 February	Arrays and images in numpy, hexadecimal representation of colors (image processing)	Lab 3	Strings & Loops	
12 February	Lincoln's Birthday: Lab closed				
17 February	President's Day: Lab closed				

#4	**Lecture:** 18 February	More on Lists & Arrays; Images; Decisions; Airplane Design	[Loop & Slice Challenges](#), [Decision Challenges](#), [turtleString.py](#), [Lecture notes](#)		Think CS: [Chapter 7](#) & [Chapter 11](#)
	Lab, Quiz, & Code Review: 18-24 February	Programming with decisions & files (flood maps)	[Lab 4](#)	[Loops & Unix](#)	
#5	**Lecture:** 25 February	Logical Expressions, Circuits, Binary Numbers; CS Survey: [Bernard Desert & Elise Harris](#) (CUNY2X@Hunter)	[Types & Decisions Challenges](#), [Logical Operators Challenges](#), [SemesterIfAndExample](#), [Basic Gates](#), [Circuit Challenge1](#), [Circuit Challenge2](#), [Circuit Challenge3](#), [Lecture notes](#)		Think CS: [Chapter 7](#), [Burch's Logic & Circuits](#), [Explain Logic Gates](#)
	Lab, Quiz, & Code Review: 25-28 February, 2 March	More on Decisions (snow pack); Circuits & Logical Expressions	[Lab 5](#)	[Decisions & Color](#)	
#6	**Lecture:** 3 March	Accessing formatted data; CS Survey: [Prof. Kelle Cruz](#) (Astrophysics)	[Arithmetic Challenges](#), [List/String Challenges](#), [Lecture notes](#)		Think CS: [Chapter 6](#), [10-minutes to Pandas Tutorial](#), [DataCamp Pandas Tutorial](#), [Ubuntu Terminal Reference Sheet](#)
	Lab, Quiz, & Code Review: 3-9 March	CSV files via [pandas](#) (population change); Shell Scripts, github	[Lab 6](#)	[Circuits, Truth Tables, & Logical Expressions](#)	
#7	**Lecture:** 10 March	Functions; NYC OpenData CS Survey: Brian Campbell, Hunter College Alumnus and Software Engineer at [Seamless](#)	[Motto Challenge](#), [quarterImage.py](#), [Hello with main()](#), [Prep #1.2](#), [Total & Tax Challenge](#), [Greet Example](#), [Happy Example](#), [Jam Example](#), [Month String Example](#), [NYC OpenData Lecture notes](#)		Think CS: [Chapter 6](#), [10-minutes to Pandas Tutorial](#), [DataCamp Pandas Tutorial](#)
	Lab, Quiz, & Code Review: 10-16 March	OpenData NYC (shelter data); Using `main()` functions; Python from the command line	[Lab 7](#)	[Formatted Data & Shell Commands](#)	
12-19	Instructional Recess - No Lecture, Online help via email and Blackboard Discussion Board				

April	available				
#8	**Lecture:** 24 March	More Functions & Parameters;	[Decisions & Functions Example](), [Dessert Exam Questions](), [Foo example](), [Koalas](), [Lecture notes]()		Think CS: [Chapter 6]()
	Lab, Quiz, & Code Review: 24-26 March	Binning data (parking tickets); Top-down design (herd of turtles); Command line `git`	[Lab 8]()	[Functions & More Pandas]()	
27 March - 1 April	Recalibration Period - No Lecture, No Online Help				
2-6 April	Online Help and Code Review 8 resume				
7 April	Wednesday at Hunter - No Lecture				
8-10 April	Spring Recess - No Online Help				
#9	**Lecture:** 14 April	Programming with Functions, Top-down Design; Mapping GIS Data (Folium); Random Number Generation; Preview: Indefinite Loops	[Sisters Example](), [numsConvert.py num2string example](), [Distance Check](), [Random Walk](), [Lecture notes]()		Think CS: [Chapter 6](), [folium tutorial]()
	Lab, Quiz, & Code Review: 14-20 April	Folium/leaflet.js (mapping CUNY locations); Finding errors; Regular expressions (command line)	[Lab 9]()	[Parameters & Functions]()	
#10	**Lecture:** 21 April	Indefinite Loops; Simulations; Design Patterns: Max;	[Nums & While](), [Max Num](), [Random Search (turtles)](), [Lecture notes]()		Think CS: [Chapter 8]()
	Lab, Quiz, & Code Review: 21-27 April	More on Indefinite loops; Writing functions; unit testing	[Lab 10]()	[More on Functions & Top-down Design]()	
#11	**Lecture:** 28 April	Python Recap; Simplified Machine Language; Design Patterns: Searching;	[Search](), [WeMIPS Emulator](),		[U Idaho reference sheet](), [MIPS Wikibooks]()
	Lab, Quiz, & Code Review: 28 April - 4 May	Simplified machine language	[Lab 11]()	[Indefinite Loops & Simulations]()	
#12	**Lecture:** 5 May	Introduction to C++: program structure, data	[cin/cout example](), [convert example](),		[Cplusplus Tutorial](),

		representation and I/O. Final Exam Overview	loops example, growth example, nested loops,		C++ Tutorials Point, The Rook's Guide to C++
	Lab, Quiz, & Code Review: 5-11 May	Using gcc	Lab 12	Simplified Machine Language & More Unix	
#13	**Lecture:** 12 May	C++ control structures	Decision example (C++), Logical Expressions (C++), Input Checking (C++), Input Checking, II (C++), Growth Example (C++),		Cplusplus Tutorial, C++ Tutorials Point, The Rook's Guide to C++
	Lab, Quiz, & Code Review: 12-14 May	Control Structures in C++	Lab 13	Introduction to C++	
MONDAY 18 May 9am-11am		Final Exam	Final Exam Information		

(This file was last modified on 27 January 2020.)