# Compsci 101

## Introduction

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Susan Rodger
August 30, 2022
DO NOT SIT IN THE LAST 5 FULL ROWS

or the small 2 seater row at the top!
Sea turtles hatching

• https://www.youtube.com/watch?v=sZYd0-egqbc
About Prof. Rodger

How do you keep your sanity?

Comp sci 101, Fall 2022
MS. Yesenia Velasco

Teaching Associate

• Right-hand woman - Handles logistics, substitute lectures, and much more!

• Handles accommodations
  • Email her your accommodation letter
  • yvelasco@cs.duke.edu
A is for ...

• **Algorithm**
  • Step-by-step instructions realized in a program

• **Abstraction**
  • Hiding things is powerful
  • “What” vs “How”

• **APT**
  • Algorithmic Problem-solving Testing

• **API**
  • Application Programming Interface - using Libraries
Announcements

- Check out the calendar on the course website
  - PRE-WORK – what you must do before the lecture
  - LECT/LAB – will put notes/videos here from the live lecture or for the lab
  - DUE – what is due each week.

- What has been updated?
  - Assignment 0 is already out!
  - Lab 0 on Friday
  - Prelab for Lab1 (install Python)
  - You will see a link to this video!
Go over CompSci 101 webpages

CompSci 101, Fall 2022
Home

CompSci 101: Introduction to Computer Science

Course Description

Introduction to practices and principles of computer science and programming and their impact on and potential to change the world. Algorithmic, problem-solving, and programming techniques in domains such as art, data visualization, mathematics, natural and social sciences. Programming using high-level languages and design techniques emphasizing abstraction, encapsulation, and problem decomposition. Design, implementation, testing, and analysis of algorithms and programs. No previous programming experience required. For this version of the course, you will learn the programming language Python 3.
Course overview, logistics
www.cs.duke.edu/courses/fall22/compsci101

- **Programming assignments: APTs and Assignments**
  - Acknowledge assistance, to learn to program ...
  - Be aware of late policy
- **Labs**
  - Attend each Friday
- **Lecture - Classwork**
  - Attend the live lecture - participate
  - If you can’t attend you must watch it and participate within 24 hours
- **Exams: 3 exams and final**
  - All old exams available
What's in Compsci 101?

• Learning about computing, computer science, and programming
  • Vocabulary of Python and programming
  • *Power of automation, repetition, scale*
  • Understanding and changing the world

• Programming using Python
  • Tools: PyCharm, Libraries, ...
  • Using mathematical and scientific techniques
  • Art and science of programming
Questions?

• Don’t send us email!!!!!!!!!!!!
• Post your questions on Ed Discussion
  • We will answer them there!
  • You should try to answer them too
    • Want to be a UTA one day? Answer questions!
• Post Questions during lecture!
Discuss with others, then everyone fills out their own form.

What is Computer Science?
How it started

How it’s going
Vacuum Tubes

• Control electric current using the vacuum
• Can be used to start/stop, or change the flow based on the current

Off/On \rightarrow 0/1
00000011
What is Computer Science now?

• Artificial Intelligence

Self-driving car

Perseverance Mars Rover

Roomba

Personal Robot
What is Computer Science?

- Medicine, Genomics
What is Computer Science?

• Animation
What is Computer Science?

- The Organization of Data, Sharing, and Searching
Prerequisites for Compsci 101
After taking this course you will be able to ....

• Write a program for Wordle
• Write a word finder to help someone solve Wordle
Wordle
Wordle

Wordle Solver

It is simple to use tool will help you solve any Wordle answer you are having trouble with.

Enter in the letters that you have gotten in the right spot into the same spot in the Correct Letters section. Add any letters that are in the puzzle but not in the right spot to Misplaced Letters area. Finally, enter anything you’ve guessed that isn’t right at all into Incorrect Letters section. The potential answers will populate as you enter in letters, eventually giving you the solution!

Correct Letters

Misplaced Letters

Incorrect Letters

Potential Answers (10)
cheek cheer chess chide chief chime choke chose niche

Recommended Guesses
CHIDE CHIEF CHIME NICHE

Common Letters
E (12) C (10) H (10) I (4) S (3) O (3) K (2)
R (2) M (1) F (1)
Wordle

**Wordle Solver**

This simple to use tool will help you solve any Wordle answer you are having trouble with. Just enter in the letters that you have gotten in the right spot into the same spot in the Correct Letters section. Add any letters that are in the puzzle but not in the right spot to the Misplaced Letters area. Finally, enter anything you’ve guessed that isn’t right at all into the Incorrect Letters section. The potential answers will populate as you enter in letters, eventually giving you the solution!

**Correct Letters**

C  H  I

**Misplaced Letters**

E  E

**Incorrect Letters**

T A M

**Potential Answers (1)**

chief

**Recommended Guess**

CHIEF

**Common Letters**

C (1)  H (1)  I (1)  E (1)  F (1)
Wordle

You will be able to write

Wordle Solver

This simple to use tool will help you solve any Wordle answer you are having trouble with. Just enter in the letters that you have gotten in the right spot into the same spot in the Correct Letters section. Add any letters that are in the puzzle but not in the right spot to the Misplaced Letters area. Finally, enter anything you’ve guessed that isn’t right at all into the Incorrect Letters section. The potential answers will populate as you enter in letters, eventually giving you the solution!

Correct Letters

CHI

Misplaced Letters

E

Incorrect Letters

T A M

Potential Answers (1)
chief

Recommended Guess
CHIEF

Common Letters
C (1)  H (1)  I (1)  E (1)  F (1)
Who has taken CompSci 101?
Why is it called Python?
Why is it called Python?
Who are you?

• Let’s look at survey to see who is taking Compsci 101 in Fall 2022
  • Do you recognize yourself?
  • Is there a stereotypical Compsci 101 student?
  • Is there a stereotypical computer scientist?

• Everyone can succeed! Ideally you won’t have lots of experience programming
How much programming have you done before?
253 responses

- None at all: 40.3%
- A little, but not much: 13.4%
- A decent amount, but been a while: 39.5%
- Enough so that I think of myself as a beginner, somewhat competent: 1.1%
- I've written a lot of code: 0.9%

How do you feel about taking CompSci 101?
253 responses

- Really nervous: 29.2%
- A little nervous: 43.9%
- Ready to get started: 16.6%
- Somewhat confident: 1.6%
- Really confident: 0.4%
What does this program do?

- "Hello World"
- Scratch Program
- Colors
  - Duke blue: motion
  - Mustard: control
  - Light blue: sensing
  - Orange: data
  - Purple: looks
WOTO: WOrking TOgether

Analyze this
Scratch Program?
WOTO: WOrking TOgether

Analyze this Scratch Program?
Scratch Program

• If you want to experiment with this scratch program, here is the link:

https://scratch.mit.edu/projects/94064630/

You don’t have to understand this yet!!
What language will we learn?

- [http://www.python.org/](http://www.python.org/)
- Python is a *multi-paradigm* language
  - Procedural
  - Functional
  - Object-Oriented
- Simple, libraries, widely used
- Guido von Rossom
```python
# Created on 1/6/2022

@author: Susan H. Rodger

if __name__ == '__main__':
    print("Hello CompSci 101!")
```

**OUTPUT:**
"Hello CompSci 101!"
Python code

hello.py

```
'''
Created on 1/6/2022

@author: Susan H. Rodger
'''

if __name__ == '__main__':
    print("Hello CompSci 101!")
```

OUTPUT:

```
C:\Users\Susan\AppData\Local\Programs\Python\Python36\hello.py
Hello CompSci 101!

Process finished with exit code 0
```
Python Code, second program

```python
def greeting(name):
    print("Hello " + name)

if __name__ == '__main__':
    greeting("CompSci 101!")
    greeting("Beanie, Keeah and Moe")
```

OUTPUT:
def greeting(name):
    print("Hello " + name)

if __name__ == '__main__':
    greeting("CompSci 101!"
    greeting("Beanie, Keeah and Moe")

OUTPUT:
Hello CompSci 101
Hello Beenie, Keeah and Moe

You don’t have to understand this yet!!
Duke Connection: Fred Brooks '53

• What Would FB Say?
"The most important single decision I ever made was to change the IBM 360 series from a 6-bit byte to an 8-bit byte, thereby enabling the use of lowercase letters. That change propagated everywhere."

• "Fred Brooks" by Copyright owned by SD&M (www.sdm.de) - Request for picture sent by email to Fred Brooks by uploader (Mark Pellegrini; user:Raul654) Fred sent this photo back, along with contact information for Carola Lauber at SD&M, who gave copyright permission.. Licensed under CC BY-SA 3.0 via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Fred_Brooks.jpg#/media/File:Fred_Brooks.jpg
Why is programming fun?

Fred Brooks

• First is the sheer joy of making things
• Second is the pleasure of making things that are useful
• Third is the fascination of fashioning complex puzzle-like objects of interlocking moving parts
• Fourth is the joy of always learning
• Finally, there is the delight of working in such a tractable medium. The programmer, like the poet, works only slightly removed from pure thought-stuff.