
# Department of Computer Science and Information Technology

# College of Science

# Salahaddin University

# Subject: Python

# Course Book (CS 3rd Year )

# Lecturer's name :Suzanne Zakaria Hussein

# Academic Year: 2021/2022

# Course Book

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| **1. Course name** | GUI Programming |
| **2. Lecturer in charge** | Suzanne Zakaria Hussein |
| **3. Department/ College** | Computer Science and Information Technology / Science |
| **4. Contact** | e-mail: suzanne.hussein@su.edu.krd<br>Tel: (0750 4182832) |
| **5. Time (in hours) per week** | Theory: 2<br>Practical: 2 |
| **6. Office hours** | Monday:8:30-10:30<br>Thursday:8:30-2:00<br>or any other times by appointment |
| **7. Course code** | SCT310 |
| **8. Teacher's academic profile** | 2006-2010: BSc in Computer science- University of Duhok<br>2015-2017: MSc in Computer engineering- Istanbul University |
| **9. Keywords** | Python Language, Programming,GUI, tkinter |

**10. Course overview:**

This course is consist of two parts, First part is arranged to take them from the ground up in python in an easy and fun way. It is easy to learn and it is very powerful tool for implementing their own ideas with python, Python is suited well for both beginning programmers as well as professional software developers. It is the third most popular language used at Google. Most importantly, Python is extremely fun to use.

The first part start off by getting python up and running on the computer, regardless of operating system. Whether are using Windows, Mac or Linux. Then an introduction on python language, Object and Data structure basics, Comparison operators, Python statements, Methods and functions, OOP.

And The second part is design GUI using Tkinter, Tkinter is one of the powerful GUI module of python .Tkinter is easy to use, easy to implement, easy to develop. Learn Tkinter from beginner's level to advance level. This part is for those who want to make their own GUI application from python. After completing this course you will be able to use many GUI elements like button, label, radiobutton, checkboxbutton, menu, canvas, message, entry, frame, listbox and many more.

Beside to the theoretical part, the students in the practical part will learn how to apply everything they learned in addition to small projects using Python.

**11. Course Objective**

This course introduces computer programming using the Python programming language. Emphasis is placed on common algorithms and programming principles utilizing the standard library distributed with Python. Upon completion, students should be able to design, code, test, and debug Python language programs. More importantly, they will learn to have a lifelong love of programming.

**12. Student's obligation**

- Attendance.
- Assignment
- Homework

- Grades

**13. Forms of Teaching**

- Powerpoint slides
- Datashow
- White board

**14. Assessment scheme for each subject**

The final grade will be based upon the following criteria:

Final : 50

Theoretical:15

Practical:30

Project or Quizzes:2.5

Group activities in lab:2.5

**15. Student learning outcome:**

Upon completion of this course, participants will have gained knowledge of Python Language and the ability to:

- Learn how to use Python professionally, learning both Python 2 and Python 3.
- Learn how to use Object Oriented Programming with classes!
- Understand how to use both the Jupyter Notebook and create .py files
- Learn advanced Python features, like the collections module.
- Understand complex topics, like decorators.
- Create games with Python, like Tic Tac Toe.
- Build a complete understanding of Python from the ground up.
- Get an enough understanding on GUI in Python programming language from where you can take yourself to a higher level of expertise.

**16. Course Reading List and References:**

- Learning Python: Lutz, Ascher (O'Reilly '98)
- Python Essential Reference: Beazley (New Riders '99)
- Programming Python, 2nd Ed.: Lutz (O'Reilly '01)
- Core Python Programming: Chun (Prentice-Hall '00)
- The Quick Python Book: Harms, McDonald (Manning '99)
- The Standard Python Library: Lundh (O'Reilly '01)
- Python and Tkinter Programming: Grayson (Manning '00)
- Python Programming on Win32:Hammond, Robinson (O'Reilly '00)
- Learn to Program Using Python: Gauld (Addison-W. '00)

| 17- | **Course Outline of Topics\Expected Time Frame (30 weeks)** | |
|---|---|---|
| **Weeks** | **Basic Tutorial Subject to be covered (Theoretical)** | **Lab (Practical)** |
| **Week 1** | **Introduction on python language** | **Anaconda setup** |
| **Week 2-4** | **DataType(Numbers, strings, lists, Dictionaries, tuples, sets, booleans)** | **int,, float,str ,list, tuple,dict, set, bool** |
| **Week 5** | **Python Operation, python statement(conditionals)** | **==, !=, >,<, >=,<=, and ,or and (If, elif, else)** |
| **Week 6** | **Python statement (loops) and python comprehensions** | **for loop and while loop range(), break, continue and pass** |
| **Week 7** | **Methods and functions (methods, functions, lambda expressions, Passing Arguments to a Function , Recursive Functions )** | **def Statements, lambda statement, *args and **kwargs** |
| **Week 8-9** | **Tic Tak Toe Game** | **Apply practically** |
| **Week 10-11** | **Nested statement, scope, files and Modules** | **Local and non local keywords, open , insert, resd, seek, readline, close, pwd,** |

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| | | **modes, datetime module** |
| **Week 13** | **Object Oriented Programming(objects, class, methods, inheritance, an special methods)** | **objects,class, methods, inheritance,an special methods)** |
| **Week 14** | **First Exam** | |
| **Week 17** | **Introduction to Tkinter( What is GUI concepts, What is Tkinter, widgets, Standard Attribute )** | **Import, mainloop, geometry, title, resizable, maxsize, minsize, iconbitmap,** |
| **Week 18** | **Label Widget and Entry widget** | **Label Widget and Entry widget** |
| **Week 19** | **Button widge, Checkbutton widget, Radiobutton widget** | **Button widge, Checkbutton widget, Radiobutton widget** |
| **Week 20** | **Tkinter geometry manager, Frame widget, Lisbox** | **Tkinter geometry manager, Frame widget, Lisbox** |
| **Week 21** | **Create Standard Calculator, Adding Validation to an Entry widget** | **Create Standard Calculator, Adding Validation to an Entry widget** |
| **Week 22-23** | **Message widget, Toplevel method, Menu, Type of Menu** | **Message widget, Toplevel method, Menu, Type of Menu** |
| **Week 24-26** | **Menubutton, Option Menu, LabelFrame, Scale widget** | **Menubutton, Option Menu, LabelFrame, Scale widget** |
| **Week 27-28** | **Scrollbar widget, spinbox widget, canvas widget, Methods of canvas** | **Scrollbar widget, spinbox widget, canvas widget, Methods of canvas** |
| **Week 29** | **Text widget, Indexing text, Tags** | **Text widget, Indexing text, Tags** |
| **Week 30** | **Second midterm exam** | **Second exam** |

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| **20. Extra notes:** |
| **21. Peer review** |

22-Examinations:

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| Ministry of Higher Education | | **Subject**: Python |
| Salahaddin University- Erbil | | **Stage**: 3rd CS & IT |
| College of Science | Second semester Exam | **Date**13/2/2019 |
| Computer Science & IT Department | 2018-2019 | **Time**: 60 Minutes |

**Student Name:**

**Q1: Fill the blanks**

1- Write arithmetic operation to find square root of number 100 ----------

2- Python is portable which mean ----------

3- Define an empty function ----------

4- Dictionaries are ---------- for storing object.

5- chr() used to ----------.

6- If i=[1,3,1,4], then set(i) =----------.

**(3 marks)**

**Q2: Write the outputs of the following, if there is any errors please mention the errors**

**(4.5 marks)**

a-

```
def pr(*arg):
    for i in arg:
        print(i)
l=[1,'A',{'k1':3}]
pr(l)
```

b-

```
print("Alev")
print(X)
```

c-

```
class s:
    Id=9
    name="none"
    def p():
        print("Name: "+name+"ID: "+self.Id)
O=s()
O.p()
```

d-

```
def one():
    z=9
    def two():
        global z
        z=10
        print("Two: ",z)
    two()
    print("One: ",z)
two()
```

e-

```
%%writefile z.txt
Hello world
Computer
```

```
Writing z.txt
```

```
z.read()
seek(0)
z.readline()
```

f-

```
T=(1,2,3)
for i in T:
    if i%2==0:
        T[T.index(i)]=i+1
print(T)
```

**Q3:**

A-Write a python class for employee info which have three main info (ID, Name and Department), ID employee generated automatically depending on date and time when you create an object for any employee. Also, the class contain a method to print all info as following:

**Input**

```
d=employee("Ali","Accounting")
d.p_info()
```

**Output**

```
ID:  20181210224532
Name:  Ali
Department:  Accounting
```

**(3 marks)**

B- Write a function to generate a tuple from two other tuples elements without duplicate as following

```
t1=(1,7,10,3,7,4,2)
t2=(3,5,2,8,0,8)
no_dup(t1,t2)
```

```
(0, 1, 2, 3, 4, 5, 7, 8, 10)
```

**(2.5 marks)**

Instructor
**Suzanne Zakaria Hussein**