# Python Language with Data Structure

## Course Description

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| **Course Code Number** | CS-221<br>**First Semester** | **Course Title** | Python Language with Data Structure |
| **Semester Hours** | 1.5 hours | **No. of Credit Units** | 3 |
| **Prerequisite** | None | **Course Coordinator** | Dr. Thi Thi Soe Nyunt |

### Course Aim

The aim of this course is

- To provide background knowledge about Object-Oriented Programming (OOP) concepts.
- To help students understand the Python programming language.
- To help students become more valuable, and skillful in writing programs and able to apply in real world IT field.

### Course Description

This course is intended to be at the post graduate diploma level in a curriculum and to provide foundation skills for subsequent courses. This course provides a basic grounding and fluency in the programming skills necessary for all students who are enthusiastic in creating programs and software. This course introduces students to, and provides practical exercises to become more skillful IT professionals.

### Reference Book

- Learning Python, 2nd Edition, by Mark Lutz and David Ascher
- A Python Book: Beginning Python, Advanced Python, and Python Exercises, by Dave Kuhlman
- Python Notes for Professionals, GoalKicker.com

### Learning Outcomes

Upon the successful completion of this course, Student will be able to:

- learn what is Object Oriented Programming and application of OOP concepts in Python.
- learn how to use standard classes and modules and learn to design their own classes and modules with Python.
- learn how to use the file I/O techniques.

**Course Organization**

Student participation in this course will involve the following activities:

1. Attending the lectures & practical
2. Preparing for and participating in the recitations
3. Practical assignments
4. Moodle (LMS) / Quiz (After each lecture)
5. Exams

**Assessment plan for the course**

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|---|---|
| Exam | 50% |
| Test / Assignment | 10% |
| Class participation | 10% |
| Moodle | 15% |
| Quiz/Tutorial | 15% |

**Grading System**

UCSY follows a letter grade system comprising of grades A, A-, B+, B, B-, C+, C, C-, D and F. All marks obtained by students during the semester will be used in the grading process.

The grading scale for this course is:

| Marks obtained | Letter Grade | Grade Point |
|---|---|---|
| >=90 | A | 4 |
| 85-89 | A- | 3.75 |
| 80-84 | B+ | 3.25 |
| 75-79 | B | 3 |
| 70-74 | B- | 2.75 |
| 65-69 | C+ | 2.25 |
| 60-64 | C | 2 |
| 55-59 | C- | 1.75 |
| 50-54 | D | 1 |
| 0-49 | F | 0 |

**Fail Grade: C-, D, F (Grade point <2)**

**Class Attendance and Participation Policy:**

- **Attendance**
  Class attendance is mandatory. Most of the material you will learn will be covered in the lecturers, so it is important that you not miss any of them. You are expected to show up on time for class, and stay for the whole lecture. Students are expected to attend each class, to

complete any required preparatory work (including assigned reading) and to participate actively in lectures, discussions and exercises.

- Mobile phones must be silenced and put away for the entire lecture unless use is specified by the instructor. You may not make or receive calls on your cell phone, or send or receive text messages during lectures.
- You are responsible for all materials sent as email. Ignorance of such material is excuse. You are responsible for all materials presented in the lectures.
- Your conduct in class should be conducive towards a positive learning environment for your classmates as well as yourself.
- **Assignment, Quizzes, Moodle Test and Labs**
  We will take a short 3 to 5 quiz for every lecture and 30 points quiz moodle test after one or two chapters. Any assignment or quiz is simply missed, regardless of the reason why (e.g. illness, work, traffic, car trouble, computer problems, death, etc), and earns a grade of zero. You are strongly encouraged to complete all assignments and attend all quizzes so that you can check that you understand the material and can throw out bad grades, or grades for which you had to miss an assignment or quiz for a valid reason. Late submissions will not be accepted for any graded activity for any reason.
- There are no extra credit opportunities.
  Students may not do additional work nor resubmit any graded activity to raise a final grade.
- **Test**

  Test will start after two or three chapters finished and the coordinator will announce the date for the test.

- **Exam**
  The exam will be conducted on-campus, in a classroom. The date/times/locations will be posted on Board as soon as possible.

  For this course, the following additional requirements are specified:
  All work submitted for a grade must have been prepared by the individual student. Students are expressly prohibited from sharing any work that has been or will be submitted for a grade, in progress or completed, for this course in any manner with a person other than the instructor and teaching assistant(s) assigned to this course). Specifically, students may not do the following, including but not limited to:

- Discuss questions, example problems, or example work with another person that leads to a similar solution to work submitted for a grade.
- Give to, show, or receive from another person (intentionally, or accidentally because the work was not protected) a partial, completed or graded solution.
- Ask another person about the completion or correctness of an assignment.
- Post questions or a partial, completed or graded solution electronically. (e.g. Web Site).
- All work must be newly created by the individual student for this course. Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the instructor.

- Posting or sharing course content (e.g. instructor provided lecturer note, assignment directions, assignment questions, or anything not created solely by the student), using any non-electronic or electronic medium (e.g. web site, FTP site, any location where it is accessible to someone other than the individual student, instructor and/or teaching assistant(s)) constitutes copyright infringement and strictly prohibited without prior approval from the instructor.

## Tentative Schedule

| No. | Topic | Week | Remark |
|---|---|---|---|
| | **Introduction to Python** | 1 | |
| 1. | Getting started with Python Language | | |
| 2. | Installation steps for Python environment | | |
| 3. | Python Variables | | |
| 4. | Indentation, Comments and Documentation | | Quiz/Assignment |
| | **Data Types and Operators** | 2+3 | |
| 5. | Data Types | | |
| 6. | Python Numbers, Casting | | |
| 7. | Strings and their operations | | |
| 8. | Python Operators and their Precedence | | Quiz/Assignment |
| | **Arrays and Collections** | 4+5 | |
| 9. | Array | | |
| 10. | List | | |
| 11. | Tuple | | |
| 12. | Set | | |
| 13. | Dictionary | | Quiz/Assignment |
| | **Conditionals and Loops** | 6 + 7 | |
| 14 | If..Else<br>If..Elif..Else<br>Nested If | | Quiz/Assignment |
| 15 | For loops<br>While loops | | Quiz/Assignment |
| | **Functions** | 8 | |
| 16 | Python functions | | |
| 17 | Parameters | | |
| 18 | Recursion | | Quiz/Assignment |
| | **Object Oriented Programming with Python** | 9 +10 | |
| 19 | What is OOP? | | |
| 20. | Class and Object | | |
| 21. | Inheritance | | |
| 22. | Scope and modules | | Quiz/Assignment |
| | **Build-in Classes and Modules** | 11 + 12 | |
| 23. | importing modules | | |
| 24. | datetime Module | | Quiz+ Assignment |

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|---|---|---|---|
| | Math Module<br>Collection Module<br>Operator Module<br>Random Module<br>Queue Module<br>Deque Module | | |
| | **User Input/Output** | 13 | |
| 25. | User Input/Output | | |
| 26. | String Formatting | | |
| | **Exception Handling** | 14 + 15 | |
| 27. | Try..Except | | |
| 28. | Else | | |
| 29. | Try..Except..Finally | | |
| 30. | User defined Exceptions | | Assignment |
| | **File Handling** | 16 + 17 | |
| 31. | File Handling | | |
| 32. | Read Files | | |
| 33. | Write/ Create Files | | |
| 34. | Delete Files | | Assignment |
| 35. | Tutorial + Revision | 18 | |