ECE 2210: Programming in Python for Electrical and Computer Engineering

Part I: Course-Specific Information

Course Modality	Asynchronous
Class Location/Time	N/A
Instructor	Lu Yu <luy@g.clemson.edu>, Office: 300B Riggs Hall
Instructor's Office Hours	**By appointment**. Email me directly and **do NOT** message me on Canvas.
Prerequisites	With a C or better grade in any one of the following courses: ENGR 1020/ENGR 1050/ENGR 1051, or MATH 1080 for physics major.
Important Dates	• May 21st, Tue. – Last day to drop a class or withdraw from the University **without** a W grade. • Jul. 9th, Tue. – Last day to drop a class or withdraw from the University **without** final grades but **with** a W grade.

Course Description

This course teaches students the basics of programming using Python. Python is a general-purpose programming language with a simple and reader-friendly syntax. In this course, you will learn how to write, read, test, as well as debugging basic Python code. Upon completion, students will master the core programming concepts such as variables, data types, statements, regular expressions, conditionals, loops, functions, etc. – via the Python programming language. Your knowledge of the capability of Python will be expanded with hands-on experience using some of the most useful Python libraries/packages for advanced math and many other purposes. The foundations of object-oriented programming (OOP) will also be covered in this course, which Python strongly supports. The course will be taught in a unique way that a comparison between Python and C will be carried out throughout whenever needed, which prepares you for the more advanced C programming course – ECE 2220.

The course has **no** pre-requisites and avoids all but the simplest mathematics and logics. Anyone with moderate computer experience should be able to master the materials in this course. A very basic knowledge of Linux would be an advantage, such as navigating through folders and issuing commands at a shell prompt.

Once a student completes this course, they should be ready to take more advanced programming courses in Python, as well as most other high-level programming languages, particularly *C*.

Student Learning Outcomes

Upon completion of this course, students should be able to:

1. Describe the basic concepting of programming.
2. Set up the programming environment of Python.
3. Understand the different number systems (binary, hexadecimal and decimal) and be able to perform the conversions between them.
4. Design and build basic Python programs using fundamental programming constructs like variables, conditional logic, loops, and functions.
5. Choose the proper built-in data structure(s) (i.e., strings, lists, dictionaries, tuples, and sets) for solving different problems.
6. Design and build basic Python programs to process textual data.
7. Test and debug small Python programs.
8. Understand the concepts of object-oriented programing (OOP) as used in Python, which include but not limited to classes, subclasses, objects, inheritance and overriding*.
9. Understand the basics of OO design*.
10. Understand the differences between procedural programming (e.g., C) and OOP (e.g., Python) *.

Required Materials

Required textbook: Think Python – How to Think Like a Computer Scientist, 2nd Edition. The pdf file of the textbook is available for downloading on Canvas.

Required computer: Students are required to have a computer with Windows, MacOS or any Linux distro installed for completing assignments.

Topical Outline

The following is the tentative outline of the course:

0. Set up the Programming Environment
1. Variables, Expressions and Statements (*Chapter 1*)
2. Functions (*Chapter 3, Chapter 6*)
3. Decision structures and Boolean logic (*Chapter 5*)
4. Repetition structures (*Chapter 7*)
5. Strings (*Chapter 8, Chapter 9*)
6. Built-in Containers: Lists, Dictionaries, Tuples and Sets (*Chapter 10 ~ Chapter 12*)
7. Case Study: Data Structure Selection (*Chapter 13*)
8. File I/O (*Chapter 14*)
9. Classes and Object-Oriented Programming (*Chapter 15 ~ Chapter 17*) *

Tentative Schedule

Weeks	Dates	Contents
Week 1	May 14 ~ May 19	Chapter 0 & 1
Week 2	May 20 ~ May 26	Chapter 1 & 2
Week 3	May 27 ~ Jun. 02	Chapter 3
Week 4	Jun. 03 ~ Jun. 09	Chapter 5
Week 5	Jun. 10 ~ Jun. 16	Chapter 6
Week 6	Jun. 17 ~ Jun. 21	Chapter 7
Week 7	Jun. 27 ~ Jun. 30	Chapter 8
Week 8	Jul. 01 ~ Jul. 07	**Midterm**
Week 9	Jul. 08 ~ Jul. 14	Chapter 10
Week 10	Jul. 15 ~ Jul. 21	Chapter 11
Week 11	Jul. 22 ~ Jul. 28	Chapter 12
Week 12	Jul. 29 ~ Aug. 04	**Final Exam**

*This is a tentative schedule and is subject to change.

Grading

Final grades will be based on the following weights: 30% homework, 30% (2~3) programming projects, 20% the midterm, and 20% comprehensive final.

A – 90% - 100%; B – 80 to < 90%; C – 70 to < 80%; D – 60 to < 70 & F – < 60%

Attendance Policy

This course is taught in asynchronous mode. Physical attendance is not required.

Additional Policies

Class cancellation: In the event of a class cancellation on a test day, the test is automatically postponed to the immediately following class unless otherwise noted.

Homework: All problem sets are due at the time and date specified on Canvas. **No** late assignments will be accepted.

Programming projects: Submission of projects will be **electronic** throughout the semester, and policies for late submission will be defined for each project. A passing grade in the course will not be awarded without completion of all programming projects.

Examinations:

- No make-up exams will be given unless an acceptable reason is presented to the instructor at least one week before the examination date. We shall have one in-class midterm, and a final exam. The final exam is 2hrs and 30mins. You can find the time of all your finals in this link: https://www.clemson.edu/registrar/student-menu/exam-spring.html
- The use of textbook, computer, cellphone and tablet is not allowed during the exams.
- The use of non-programmable calculator is allowed.
- One page of double-sided handwritten note sheet (size of A4) is allowed for the midterm.
- Two pages of double-sided handwritten note sheets (size of A4) are allowed for the final.

Re-grades: Re-grade requests must be made within **one week** of the return of the graded item.

Part II: University Policies and Student Support

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

All infractions of academic dishonesty by undergraduates must be reported to Undergraduate Studies for resolution through that office. In cases of plagiarism instructors may use the Plagiarism Resolution Form.

See the Undergraduate Academic Integrity Policy website for additional information and the current catalogue for the policy.

For graduate students, see the current graduate student handbook for all policies.

Access Accommodations

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the instructor know and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen, if at all possible, but there could be a significant wait due to scheduled appointments. Students who have accommodations are strongly encouraged to request, obtain and send these to their instructors through the AIM portal as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester.

You can access further information at the Student Accessibility website. Other information is at the university's Accessibility Portal.

Anti-Harassment and Non-Discrimination

The Clemson University Title IX statement: Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex,

sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This Title IX policy is located on the Campus Life website. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Executive Director of Equity Compliance. Her office is located at 223 Brackett Hall, 864.656.0620. Remember, email is not a fully secured method of communication and should not be used to discuss Title IX issues.

Emergency Procedures

Emergency procedures have been posted in all buildings and on all elevators. Students should be reminded to review these procedures for their own safety. All students and employees should be familiar with guidelines from the Clemson Police Department. Visit here for information about safety.

Clemson University is committed to providing a safe campus environment for students, faculty, staff, and visitors. As members of the community, we encourage you to take the following actions to be better prepared in case of an emergency:

1. Ensure you are signed up for emergency alerts
2. Download the Rave Guardian app to your phone (https://www.clemson.edu/cusafety/cupd/rave-guardian/)
3. Learn what you can do to prepare yourself in the event of an active threat (http://www.clemson.edu/cusafety/EmergencyManagement/)

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