CIS8005– Data Programming (Fall 2021)
Course Syllabus

Instructor:	**Dr. Yuan Long**
Office Hours:	Tuesday 1:30 am to 3:00 pm or by appointment **In case you are not able stop by my office, please attend my virtual meeting at** https://us06web.zoom.us/j/5066705770
Email:	ylong4@gsu.edu
Office Phone:	404-413-7385
Office:	RCB Room #908
GTA	Ayush Shah ashah62@student.gsu.edu

Class Meeting Time and Location:
Monday 5:30 pm to 9:45 pm @ GSU Buckhead 1203

Course Text and Materials:

- Y. Daniel Liang, "Introduction to Programming Using Python"
  ISBN-13: 978-0132747189 ISBN-10: 0132747189

- Wes McKinney, "Python for Data Analysis"
  ISBN-13: 978-1491957660 ISBN-10: 1491957662

- Andreas C. Müller, "Introduction to Machine Learning with Python"
  ISBN-13: 978-1449369415 ISBN-10: 1449369413

- Lecture Notes, Handouts, and/or Supplemental Materials-posted by Instructor.

Other useful resources:

- Allen B. Downey, "Think Python"
  ISBN-13: 978-1449330729 ISBN-10: 144933072X

- Mark Lutz, "Learning Python"
  ISBN-13: 978-1449355739 ISBN-10: 1449355730

Course Description:
Topics covered in this course are divided into three groups: (1) Basic of Python and OOP basics, (2) Advanced Python and OOP, GUI Development, and (3) Data Programming using Python (4) Machine Learning.

Course Objectives
Upon completion of the course, each student will be able to:

1) Create, debug, execute, and test well-designed and readable Python applications using the elements of the Python language.
2) Apply OOP concepts (i.e. encapsulation, inheritance, and polymorphism) to implement Python classes.
3) Understand and reuse Python libraries.
4) Use the Python API to build database driven applications.
5) Able to develop an advanced GUI using Python.

6) Use the Python libraries to do some Data Analysis.
7) Use the Python libraries to do some Machine Learning.

Course Grading

		Percentage
Five In Class Assignments	Group	2+2+2+2+2%
Three Individual Assignments	Individual	8+8+8%
Mid-term	Individual	33%
Group project	Group	33%
Total Points		100%

Grade Distribution

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Total Points	97.0 - 100	93.0 - 96.9	90.0-92.9	87.0-89.9	83.0-86.9	80.0-82.9	77.0-79.9	73.0-76.9	70.0-72.9	60.0 - 69.9	Below 60.0

Participation & Attendance

Students are required to attend all classes during scheduled class time. In extraordinary circumstances, a student may be allowed one (1) absence with prior notification AND prior professor approval. More than one unexcused absence may result in the student being dropped from the course.

Students who want to do well in this course will attend class following the class attendance policy. You will need an excused absence due to illness. GSU has a new process for students seeking excused absences through the Dean of Students Office. Please submit documentation to https://deanofstudents.gsu.edu/student-assistance/professor-absence-notification/. I will then be notified by the Dean of Students of any excused absences.

Should a student test COVID positive, any accommodations to the class attendance policy will be informed by evolving guidance from the CDC on quarantine. In most cases there will be no major change to mode of course delivery, so students will be responsible for collecting notes for missed in-person classes and making up any work they miss during quarantine. Anyone who has a positive COVID test is encouraged to alert the university so that appropriate contact tracing can be conducted.

You probably have an opinion on the effectiveness and use of masks to limit the spread of COVID-19 but wearing a face mask is not required in Georgia State classrooms. I will be wearing my face mask, and you are encouraged to wear yours. If you choose not to wear a face mask there is no penalty, and students should not engage an any type of disruptive behavior towards those who have made a different choice about wearing a mask.

Class Procedures

Each class is divided into a series of mini-lectures– with short (5-10 minutes) exercises in between. This will maximize student to student and student to teacher interaction and practice which are essential for mastery.

Student Groups

The groups are assigned for the entire term. Groups will complete the group projects and in-class assignments together. Each group has TWO students. The group members should follow the pair programming technique for collaboration. One, the **driver**, writes code while the other one, the navigator, review each line of code as it is typed in. The two programmers switch roles frequently.

See more details about this collaboration technique at
https://www.youtube.com/watch?v=vgkahOzFH2Q .

Course Project

The concepts of this course are best learned by applying them to real-world business problem. Detailed requirements of the team project are provided in iCollege. The course project, which is intended to capture most aspects of the course, will also serve as a form of "comprehensive" test of all aspects of the course, as well as each student's ability to effectively work in teams (a top request of company recruiters these days).

Assignments

There are team assignments and individual assignments. The due dates are stated below in iCollege. Every student must submit an individual assignment via iCollege to receive credit. Only one submission is required for a team assignment. A teammate peer evaluation form must accompany every team assignment submission. The grades of team assignments may be adjusted for team members who do not contribute sufficiently to the assignment. Each student must submit a teammate peer evaluation by the designated due date and time.

An important aspect of this class is to learn by doing. The individual assignments are to be completed individually, not as a team. Do not discuss these assignments with your classmates. If you have questions, contact the instructor. Team assignments are to be completed only by team members. Do not collaborate with anyone outside your team. Plagiarism, duplicate individual assignments, or individual assignments that have been completed in collaboration with another person are violation of academic integrity.

Anyone found to have committed or facilitated academic dishonesty will receive a grade of "zero" on the assignment/project, a point deduction equivalent to two final grade levels (e.g. from a B to a D), and a charge of academic dishonesty filed with the Dean's office. ***Be sure to protect your intellectual property from theft - both the person copying an assignment and the person supplying the copy will be penalized equally!*** More information about academic dishonesty can be found in the GSU Policy on Academic Honesty.

Each student is expected to complete his or her assignments in the allocated time. Late assignments will be accepted for 24 hours after the due date/time with a 10% penalty.

Missing Exams/Presentations

The time for taking an exam is not negotiable. There are no make-up exams except extreme emergence cases.

Valid Excuses

Valid excuses include illness, family emergency, death of a relative or friend, immigration interviews, religious holidays, University-sponsored trips, and out-of-town job interviews. Independent documentation may be required. Students are encouraged to communicate with the instructor regarding any absences or

other difficulties that may arise. On a case-by-case basis, the instructor will make exceptions for some other unusual circumstances.

Schedule Changes
Changes in the content and/or schedule as well as the assignments may be made as the course progresses. These changes will be announced in class and on the course website well ahead of scheduled time. You are responsible for making yourself aware of such announcements.

Grading Disputes
While the graders and the instructor make every effort to grade your work accurately, grading errors occur. Students with questions about grades should contact the instructor within one week after the publish of grades. If re-grading is requested, the paper or exam will be re-graded in its entirety such that all grading errors will be corrected. Grading errors can occur both ways. As a result, your grade may go up or down after the re-grading.

General Class Policies

Student work submitted in fulfillment of course requirements and any student activity recorded is deemed to be granted in the public domain (copyright-free) for the purposes of use as instructional or research material or for examples of student work in future courses.

Students are expected to attend all classes and group meetings, except when precluded by emergencies, religious holidays or bona fide extenuating circumstances.

Students who, for non-academic reasons beyond their control, are unable to meet the full requirements of the course should notify the instructor. Incompletes may be given if a student has ONE AND ONLY ONE outstanding assignment. Please see http://www.gsu.edu/es/20399.html for details regarding withdrawals. Spirited team participation is encouraged and informed discussion in the team is expected. Unless specifically stated by the instructor, all exams and assignments are to be completed by the student alone. Within group collaboration is allowed on project work. Collaboration between project groups will be considered cheating unless specifically allowed by an instructor. Work copied from the Internet without a proper reference will be considered plagiarism and is subject to disciplinary action as delineated in the Student Handbook. Any non-authorized collaboration will be considered cheating and the student(s) involved will have an Academic Dishonesty charge completed by the instructor and placed on file in the Deans office and the CIS Department. All instructors regardless of the type of assignment will apply this Academic Dishonesty policy equally to all students. See excerpt from the Student Handbook below:

Academic Honesty

(Abstracted from GSUs *Student Handbook* Student Code of Conduct Policy on Academic Honesty and Procedures for Resolving Matters of Academic Honesty - http://www2.gsu.edu/~wwwdos/codeofconduct.html .)

As members of the academic community, students are expected to recognize and uphold standards of intellectual and academic integrity. The University assumes as a basic and minimum standard of conduct in academic matters that students be honest and that they submit for credit only the products of their own efforts. Both the ideals of scholarship and the need for fairness require that all dishonest work be rejected as a basis for academic credit. They also require that students refrain from any and all forms of dishonorable or unethical conduct related to their academic work.

Students are expected to discuss with faculty the expectations regarding course assignments and standards of conduct. Here are some examples and definitions that clarify the standards by which academic honesty and academically honorable conduct are judged at GSU.

Plagiarism. Plagiarism is presenting another persons work as ones own. Plagiarism includes any paraphrasing or summarizing of the works of another person without acknowledgment, including the submitting of another students work as ones own. Plagiarism frequently involves a failure to acknowledge in the text, notes, or footnotes the quotation of the paragraphs, sentences, or even a few phrases written or spoken by someone else. The submission of research or completed papers or projects by someone else is plagiarism, as is the unacknowledged use of research sources gathered by someone else when that use is specifically forbidden by the faculty member. Failure to indicate the extent and nature of ones reliance on other sources is also a form of plagiarism. Failure to indicate the extent and nature of ones reliance on other sources is also a form of plagiarism. Any work, in whole or part, taken from the internet or other computer based resource without properly referencing the source (for example, the URL) is considered plagiarism. A complete reference is required in order that all parties may locate and view the original source. Finally, there may be forms of plagiarism that are unique to an individual discipline or course, examples of which should be provided in advance by the faculty member. The student is responsible for understanding the legitimate use of sources, the appropriate ways of acknowledging academic, scholarly or creative indebtedness, and the consequences of violating this responsibility.

Cheating on Examinations. Cheating on examinations involves giving or receiving unauthorized help before, during, or after an examination. Examples of unauthorized help include the use of notes, texts, or crib sheets during an examination (unless specifically approved by the faculty member), or sharing information with another student during an examination (unless specifically approved by the faculty member). Other examples include intentionally allowing another student to view ones own examination and collaboration before or after an examination if such collaboration is specifically forbidden by the faculty member.

Unauthorized Collaboration. Submission for academic credit of a work product, or a part thereof, represented as its being ones own effort, which has been developed in substantial collaboration with assistance from another person or source, or computer honesty. It is also a violation of academic honesty knowingly to provide such assistance. Collaborative work specifically authorized by a faculty member is allowed.

Legal Requirements: Some project assignments may require legal agreements with the respective clients, and some projects may not require legal agreements. In cases where legal agreements are necessary, legal documents are available for student use. All students are expected to be familiar with the terms of the legal requirement documents furnished by the University.

All student work presented for course credit will identify the sources of information used, and any sources quoted *verbatim* will be further identified by including the material in quotations. Any material included in work submitted that is copied from other sources without giving credit for the source will result in a grade of F for the course.

Communication: E-mail is the preferred way to communicate with the instructors. Send all messages to the instructor's iCollege account . As the e-mail is filtered automatically, each message **must** have following format in the *subject* header to receive a quick response: CISCourseNo-SemesterYear-*topic,* where *topic* is one of the following: Midterm, Assignment-1, In Class Assignment-2, Administrative-issues, or the various topics covered in class (for example, CIS8005-Fall2021-Midterm)

Tentative Course Schedule

Date	Week	Topic	Readings & Notes
08/16/2021	Week 1	Introductions, Syllabus review; Introduction to programs, Python and Elementary programming String and Objects Selections In Class Assignment (not for grading)	Liang – ch1-4
08/23/2021	Week 2	Loops Functions Objects and Classes GUI Programming In Class Assignment 1	Liang – ch5,6 Liang – ch9 Liang - ch10 **Individual Assignment 1 Due 08/29**
08/30/2021	Week 3	Lists, Multidimensional Lists Inheritance and Polymorphism Files and Exception Handling Tuples, Sets and Dictionaries In Class Assignment 2	Liang – ch7,8 Liang – ch12 Liang – ch13,14 **Individual Assignment 2 Due 09/09**
09/11/2021	Week 4	Recursion Introduction to Data Science (GitHub, Anaconda, Python Data Science Libraries) **Project Handout/Proposal** Introduction to NumPy Introduction to Pandas In Class Assignment 3	Liang - ch15 McKinney – ch1 McKinney – ch4,5
09/13/2021	Week 5	**Midterm Exam** Introduction to Matplotlib Visualizing the Data Introduction to HTML, XHTML, CSS, XML, JSON Dataset Load	 McKinney – ch8 McKinney – ch6 **Individual Assignment 3 Due 09/19**

09/20/2021	Week 6	Python and Relational Database (SQLite) Python and NoSQL Database (MongoDB) Conditioning the Data Shaping the Data In Class Assignment 4	McKinney – ch6 McKinney – ch7
09/27/2021	Week 7	Using Python in Machine Learning In Class Assignment 5	Müller – ch1-3
10/4/2021	Week 8	Project Presentation	