**CIS8005– Data Programming  
Monday 5:30 PM – 9:45 PM**

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| Instructor: | **Andrea Aria** |
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| Office: | 17th floor, 55 Park Place |
| Prerequisite: | NA |

**Required Textbooks**

Introduction to programming using Python ISBN-13: 978-0132747189

ISBN-10: 0132747189

Learning Python**,** ISBN-13: 978-1449355739

ISBN-10: 1449355730

Python Data Analysis, ISBN-9781783553365

Different online materials

**Important Note**

This syllabus provides a general guideline for the conduct of this course. However, deviations will be necessary. Updates will be given during the semester.

**Catalog Description**

This course builds upon the student’s foundation of programming principles through the introduction of a programming language such as Python and going through advanced topics of Python and OOP.

**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:

\* Create, debug, execute, and test well-designed and readable Python applications using the elements of the Python

language.

\* Apply OOP concepts (i.e. encapsulation, inheritance, and polymorphism) to implement Python classes.

\* Understand and reuse Python libraries.

\* Use the Python API to build database driven applications.

\* Able to develop an advanced GUI using Python.

* Use the Python libraries to do some Data Analysis
* Use the Python libraries to do some Machine Learning

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| **Instructor Responsibilities** | |  | **Student Responsibilities** | |
| 1. | Come prepared to every class. |  | 1. | Come prepared to every class. |
| 2. | Plan the class so that objectives can be achieved. |  | 2. | Complete all work on time. |
| 3. | Treat students as responsible adults. |  | 3. | Behave as a responsible adult. |
| 4. | Create a mutually respectful classroom environment. |  | 4. | Treat others with respect. |

**Course Projects**

For the course project, students, working in groups of two, will prepare fully functioning programs, of significant complexity, in Python that address a typical business need in data analysis field. The complete specifications for the projects will be covered in a separate handout.

**Exams**

Make-up exams are NOT given. Students missing an exam will receive a zero on that exam. Exams may be taken early if the instructor is given a legitimate reason (religious holiday, scheduled surgeries, pregnancy, etc.). Proof of reasons must be scanned and sent to the instructor ahead of time (unless absence was due to a legitimate emergency, in which case scanned proof must be sent afterwards).

**Lab assignments**

Each student is expected to complete his or her lab assignments in the allocated time. All assignments are due on the due date till 11:59 pm. Late assignments will be accepted for 24 hours after the due date/time with a 10% penalty.

Make sure to package the assignment into a zip file. Make sure to include the Source Code, Class Files, JSP files, html files, etc - include in zip and submit through course email.

All work must be your own. Duplicate lab assignments will be given a grade of "zero", a point deduction equivalent to one final grade level (i.e. from a B- to a C-), and a charge of academic dishonesty. Both the person copying the assignment and the person supplying the copy will be penalized equally! LET ME REPEAT THIS...working with other students on a lab assignment will result in a charge of academic dishonesty, a zero given, and a point deduction of one final grade to all participants!

**Conduct of Course: Lecture/Discussions, Demos, and Labs**

Class sessions will be divided between: (1) lecture/discussion of certain software concepts and features, (2) instructor demonstrations of these same software concepts and features, and (3) student laboratory sessions working with these same software concepts and features.

The purpose of this pedagogical approach is to introduce and reinforce ideas and skill sets so that students can master these on their own after class hours. To bring this knowledge to a highly proficient, professional level, students will have to spend time and effort outside of class working in the GSU computer labs or on their own computers.

To ensure that you have the basic knowledge that will allow you to function on your own after class, be sure to ask the instructor questions during class, either during the lecture/discussion, demo, or lab.

**Course Outline – Fall 2023**

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| **Week** | **Topic** | **Text** |
| Week 1 | Introductions, Syllabus review; Introduction to programs,  Python and Elementary programming |  |
| Week 2 | String and Objects  Selections, Loops  Functions  In Class Assignment |  |
| Week 3 | Objects and Classes  More on Strings and Special Methods |  |
|  | Objects and Classes |  |
| Week 4 | Objects and Classes  GUI Programming  In Class Assignment |  |
| Week 5 | Lists, Multidimensional Lists |  |
|  | Inheritance and Polymorphism |  |
| Week 6 | Files and Exception Handling  Tuples, Sets and Dictionaries  In Class Assignment |  |
| Week 7 | Recursion  Introduction to Data Science (GitHub, Anaconda, Python Data Science Libraries)  In Class Assignment |  |
| Week 8 | **Midterm Exam** |  |
| Week 9 | **Project Handout/Proposal**  Introduction to NumPy  Introduction to Pandas |  |
| Week 10 | Introduction to Matplotlib  Visualizing the Data  Introduction to HTML, XHTML, CSS, XML, JSON  Dataset Load  InClass Assignment |  |
| Week 11 | Python and Relational Database (SQLite)  Python and NoSQL Database (MongoDB) |  |
| Week 12 | Conditioning the Data  Shaping the Data  In Class Assignment |  |
| Week 13 | Using Python in Machine Learning |  |
| Week 14 | Using Python in Machine Learning  In Class Assignment |  |
| Week 15 | Project Presentation |  |
| Week 16 | Project Presentation |  |

The lab assignment due date is as follow:

**Lab Assignment - 09/08**

Refer to the GSU calendar for drop dates and final exam dates.

Final exam schedule: <http://registrar.gsu.edu/registration/semester-calendars-exam-schedules/>

**Policies**

**Academic Honesty**

**Students may have general discussions about lab assignments with fellow classmates, but each student must develop his or her solution to the lab assignments. It is each student’s responsibility to keep his/her own work secure. Failing to adequately protect one’s work does not relieve the student from academic dishonesty charges.**

University regulations will be enforced regarding dishonorable or unethical conduct (Cheating, Plagiarism, Falsification, Unauthorized Collaboration or Multiple Submissions). The penalties for incidents of academic dishonesty can lead to expulsion from the University (see General Catalogue p. 64, Student Handbook p. 130 or <http://www2.gsu.edu/~wwwdos/codeofconduct_conpol.html>). In this class, there will be zero tolerance for dishonorable or unethical conduct. Electronic or physical sharing of answers will be considered cheating and will not be tolerated.

Cheating on examinations involves giving or receiving unauthorized help before, during, or after an examination. Examples of unauthorized help include sharing information with another student during an examination, intentionally allowing another student to view one’s own examination, and collaboration before or after an examination which is specifically forbidden by the instructor.

Submission for academic credit of a work product, or a part thereof, represented as its being one’s own effort, which has been developed in substantial collaboration with assistance from another person or source, or computer based resource, is a violation of academic honesty. It is also a violation of academic honesty to knowingly provide such assistance.  Collaborative work specifically authorized by an instructor is allowed.  (*Collaboration on all individual assignments is forbidden.  If your instructor discovers that you have had unauthorized assistance or collaboration, the instructor is obligated to file a report with the Dean’s Office.)*

If a student is charged with Academic Dishonesty, for each charge, a zero (0) with be given for the assignment, a minimum of point equivalent of one final grade (i.e. B- to a C-) will be deducted from the final course total points and a written Notice of Academic Dishonesty will be given to the Dean’s office. The student will also receive a copy of the notice.

Unless specifically stated by the instructor, all exams and lab 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.

Copy work from the Internet without a proper reference will be considered plagiarism and subject to disciplinary action as delineated in the Student Handbook.

**Attendance**

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

**Class participation**

All students are required to attend all classes. If one or more class is missed, it is the student's responsibility to determine the specific material covered during their absence and make the necessary arrangements for making up what is missed. Class discussion is strongly encouraged. Participation will include quizzes given during the semester.

**Grading Policy**

Lab Assignments 18%

In Class Assignment 10 %

Mid-term 40%

Term Project/Verbal Exam 32%

Total 100%

**Plus/minus Final Grade Policy**

**Percentage Numeric Range Letter Grade**

97-100 A+

93-96 A

90-92 A–

87-90 B+

83-86 B

80-82 B–

77-80 C+

73-76 C

70-72 C–

60-69 D

Less than 59 F

**Incompletes**

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.

**Python Interpreter**

Will be discussed in the class

**Integrated Development Environment**

Will be discussed in the class

**Prerequisites**

Prerequisites are strictly enforced. Students failing to complete a prerequisites with a grade of “C” or higher will be administratively withdrawn from the course in which they are in violation with a loss of tuition fees. There are no exceptions.

**Participation**

Spirited class participation is encouraged and informed discussion in class is expected. This requires completing readings and assignments before class. This also requires an input and output audio device.

**Submissions**

A copy of student work is kept on file with the instructor for future reference.

**Withdrawing**

A 'W' grade will be assigned if a student withdraws before the middle of the semester while maintaining a passing grade. A 'WF' will be assigned if a student withdraws before the middle of the semester while doing failing work OR after the middle of the semester.