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| **COURSE INFORMATION** |  |
| **Prerequisites** | **None** |
| **Meeting Location** | **Online** |
| **Instructor Name** | **Dr. Javier Baez** |
| **Instructor Email** | **[jbaez@maryville.edu](mailto:jbaez@maryville.edu)** |
| **Instructor Phone** |  |
| **Instructor Office Hours** | **By Appointment** |

[Python Data Science Handbook,](https://jakevdp.github.io/PythonDataScienceHandbook/) 1st Edition, VanderPlas, Jake

[Automate the Boring Stuff with Python](https://automatetheboringstuff.com/), 2nd Edition, Sweigart, Al.

**Required Textbook(s)**

**COURSE MATERIALS**

**Required Technical Requirements** Maryville Email, Canvas, Microsoft Word

**Required Additional Readings** As assigned in Canvas

# COURSE DESCRIPTION

This course covers data types, statements, expressions, control flow, top Python core libraries (NumPy, SciPy, Pandas, Matplotlib and Seaborn), and modeling libraries (Statsmodels and Scikit-learn). Project based learning is used to help students develop effective problem solving skills and effective collaboration skills.

**COURSE OBJECTIVES**

This is a fast paced introductory course to the Python programming languages. It is intended for those with little programming background. By the end of this course, you should be able to:

* Manipulate various Python datatypes, such as lists, tuples, dictionaries, lists and arrays etc.
* Write your own functions using loops and conditional execution.
* Build simple statistical models and data visualizations
* Isolate and fix common errors in Python programs.
* Write small-scale Python programs using the above skills.

# COURSE COMPONENTS

The following table summarizes the minimum clock hour estimates for this course in compliance with Maryville University credit hour policy and Federal Guidelines (34 CFR Section 668.8):

|  |  |
| --- | --- |
| **Hours of Instruction1** | **Hours** |
| Classroom | 45 |
| Labs | 0 |
| Studio | 0 |
| Field Experience (Clinical, Practicum) | 0 |
| **Total In-class Hours** | **45** |
|  |  |
| **Hours of Student Work Outside of Class2** |  |
| Required Discussions/Conferences/Field | 0 |

|  |  |
| --- | --- |
| Classroom Preparation  (Readings/Practice/Assignments/Tutorials/Problems) | 47 |
| Homework, Exam Study and Take Home Exams | 23 |
| Projects (Research/Papers/Presentations) | 20 |
| **Total Out-of-Class Hours** | **90** |
| **Grand Total Hours of Engagement** | **135** |

**NOTE**: The hours presented in the table provide estimates for the average time required for completion of course components. Students may require additional time to successfully master topics, complete projects or to comprehend required readings. Completing the times listed below does not guarantee a specific level of success in the course.

# GRADED COURSE COMPONENTS AND ASSOCIATED POINT VALUES

|  |  |
| --- | --- |
| **COMPONENT TYPE** | **Grade Distribution** |
| **Discussions** | 10% |
| **Labs** | 45% |
| **Projects** | 45% |

**GRADING CRITERIA FOR COURSE COMPONENTS**

Students are expected to do their own work. Students will be asked to show their work on all assignments to receive full credit. Late work will not be accepted unless arrangement are made prior to the due date. All sources must be documented in the body of your work. All written assignments may be subject to submission to anti-plagiarism software such as Vericite.

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| --- | --- | --- | --- |
| **GRADING SCALE** |  | | |
| 94% – 100% | A | 78% – 79.9% | C+ |
| 90% – 93.9% | A- | 74% – 77.9% | C |
| 88% – 89.9% | B+ | 70% – 73.9% | C- |
| 84% – 87.9% | B | 60% – 69.9% | D |
| 80% – 83.9% | B- | 0% – 59.9% | F |
| **ATTENDANCE** |  |  |  |

Regular class attendance and participation is expected. Only authorized and/or documented absences are considered in changing assignment due dates or exam dates on a student-by-student basis. Students are responsible for any work, instructions, or class materials missed as a result of any absence, excused or unexcused. Communicating an absence with the instructor and/or making alternate arrangements for an assignment/test is the student’s responsibility. Failure to communicate results in failing grades, absolutely no exceptions.

# LATE WORK/MAKE-UP WORK

Late work will not be accepted, nor will partial credit be given, for any reason, without prior notification and advance approval of an authorized absence by the instructor. **This is a zero-tolerance policy**.

It is acknowledged that the course may not always go as planned due to technical issues. If a technical issue arises, it is your responsibility to communicate the issue to the professor immediately if it influences your ability to submit your work on time. Failure to communicate technical issues as they occur (even right at a submission deadline) will result in a zero on an assignment, no exceptions.

# WRITTEN WORK

Work will be graded on content, grammar, formatting requirements and adherence to the instructor’s

submission guidelines and instructions.

# TENTATIVE COURSE SCHEDULE

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** |  | **Reading Due for Class** | **Assignments /**  **Class Activity** |
| Week 1 | * Introduction to Jupyter and Python * Arithmetic and variables * Basic data types | AtBSwP, Chapters 1 and 6 | Homework 00  Homework 01 |
| Week 2 | * Lists, tuples, and dictionaries * For loops * Conditional statements | AtBSwP, Chapters 2 and 4 | Homework 02  Project 01 |
| Week 3 | * While loops * Defining functions * Working with packages | AtBSwP, Chapter 3 | Homework 03 |
| Week 4 | * Plotting with Matplotlib * NumPy arrays * Random number generation | PDSH, Chapters 2 and 4 | Homework 04  Project 02 |
| Week 5 | * 2D NumPy arrays * Dictionaries * Data manipulation with Pandas | AtBSwP, Chapter 4  PDSH, Chapter 3 | Homework 05 |
| Week 6 | * Grouping and Aggregation * Classes * Introduction to machine learning | PDSH, Chapter 5, Sections:   * What is Machine Learning? * Introduction to Scikit-Learn | Homework 06  Project 03 |
| Week 7 | * Introduction to Scikit-Learn * Precision and Recall * Linear Models | PDSH, Chapter 5, Section:   * In-Depth: Linear Regression | Homework 07 |
| Week 8 | * Decision trees * Random forests * One-Hot Encoding | PDSH, Chapter 5, Sections:   * In-Depth: Decision Trees * Feature Engineering | Homework 08  Project 04 |

\*Syllabus subject to change at the discretion of the professor.