**DEPARTMENT:** BIOS / DS

**COURSE NUMBER:** XXX  **SECTION NUMBER:**

**CREDIT HOURS:** z  **SEMESTER:** Fall 2021

**COURSE TITLE:** Python Programming (for BIOS)

**CLASS HOURS AND LOCATION:**

# INSTRUCTOR: Steve Pittard

# TEACHING ASSISTANTS:

# INSTRUCTOR CONTACT INFORMATION

# OFFICE HOURS

# COURSE DESCRIPTION

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

* Employ Python interactively to (re)shape and transform data sources
* Import data from different sources including text files, databases, and APIs
* Know the differences and advantages of high level data types such as lists and dictionaries
* Understand and implement program flow control statements to efficiently process data
* Identiy, install, and maintain community contributed modules
* Effectively use Python virtual environments to facilitate software development
* Understand the differences and advantages between object oriented and functional programming
* Visualize data relationships and write code to produce annotated plots

# EVALUATION

The grade assignment will be based on:

4 Homework Assignments (20%)

Final Exam (20% each).

# COURSE STRUCTURE

The course will be organized into weekly lectures consisting of a combination of electronic slides, whiteboard problem solving, and computational demonstrations. Students are expected to ask and answer questions in class.

# COURSE CALENDAR AND OUTLINE

Topics and dates are subject to change as the semester progresses.

# Lecture 1 Intro to virtual environments

# Lecture 2 Variables, Data Type, String Processing

# Lecture 3 Arithmetic, Expressions

# Lecture 4 I/O (reading from files and Databases)

# Lecture 5 Flow Control and Branching

# Lecture 6 Loops and Iteration

# Lecture 7 Data frames (pandas)

# Lecture 8 Effective Use of Lists and Dictionaries

# Lecture 9 Using Graphics

# Lecture 10 Functions

# Lecture 11 Functions and Modules

# Lecture 12 Testing and Debugging

# Lecture 13 Object Oriented Programming

# Lecture 14 Class Inheritance

# Lecture 15 Using APIs to obtain and manage data

# Lecture 16 Intro to scikit learn