Practical Introduction to Programming for Scientists

Course:	**GS-SB-406**
Credits:	3
Didactic:	Y
Academic Year:	2016
Term:	3
Room:	N315
Class:	MF, 9:00 AM – 10:30 AM

COURSE DIRECTOR CONTACT INFORMATION
Name: Steven Ludtke, Ph.D.
Office: BCMN-N410
Email: sludtke@bcm.edu
Office Hours: No specific hours, but mornings are generally preferred

COURSE DESCRIPTION AND OBJECTIVES:
In this course students will learn Python, one of the most widely used scripting languages in scientific computing. The course is primarily aimed at students with little or no programming background, but those with some programming experience in other languages wishing to learn Python are also welcome. The course covers basic programming concepts and data structures, and students will learn to write simple programs to improve their data processing productivity. We will also cover a number of open source scientific libraries available in Python (Biopython, SciPy, Matplotlib, etc.). Some basic familiarity with using a computer will be expected, and each student must have a laptop computer for use in class to be brought to each lecture.

REQUIRED TEXTS AND MATERIALS:
There is no official text for the class, though I will circulate an electronic draft of an incomplete book I've been writing. All students are required to have a laptop computer of some sort. It need not be very powerful, and no specific OS is required.

PREREQUISITE(S) or EXCLUSIONS:
None

ATTENDANCE REQUIREMENTS:
Attendance is not formally recorded, though generally expected. Lectures are normally recorded, and available online in case of missed lectures.

GRADING:
50% homework, 50% class project and presentation (in lieu of final)
The class is generally graded leniently on a 0-4 scale:
4 (A) – Assigned program functions largely as expected with only minor flaws
3 (B) – Program not fully functional, but most aspects of the assignment have been reasonably attempted
2 – No elements of program functional, but a reasonable effort was made
1 – Something was turned in, but it does not appear that much of an effort was made
0 – Missing assignment

A total of ~8-10 homeworks over the term, with greater frequency at the beginning, shifting to time to work on class projects at the end.

Class project is to write a program to do "something useful which is not easily achieved with existing tools). Scope of projects will depend on previous experience level. Each student will also give a brief 5 minute presentation of their project at the end of the term.

PROFESSIONAL CONDUCT:

Students are expected to conduct themselves in a professional manner and abide by all policies of Baylor College of Medicine, the Graduate School of Biomedical Sciences and their Programs. Any conduct not in keeping with the ethical or professional standards of BCM is defined as professional misconduct. Academic misconduct is defined as dishonesty (e.g. cheating, plagiarism, etc.) that occurs in conjunction with academic requirements such as coursework including homework and examinations.

STUDENT DISABILITY SERVICES:

Students with documented disabilities can seek accommodations from Student Disability Services at 713-798-8137 or email to the Student Disability Coordinator, Ms. Mikiba Morehead at mikiba.morehead@bcm.edu. Information about a student's disability will be kept private. The student is responsible for informing the course director of approved accommodations prior to the first examination.

COURSE SCHEDULE:

Date	Content	Instructor	Email Address
1/6	Introduction, data types	Ludtke	sludtke@bcm.edu
1/9	Loops, Conditions and Variables	"	"
1/13	Writing Programs		
1/16	Holiday		
1/20	Standard Libraries, Nested Loops		
1/23	BioPython		
1/27	Numerical Computing		
1/30	OOP, XML, Network Programming		
2/3	Image Processing		
2/6	Debugging, GUI Intro		
2/10	Databases, Data Compression		
2/13	JavaScript, Networking cont'd		
2/17	Controlling the Outside World		
2/20	Holiday		
2/24	Regular Expressions, Parsing		
2/27	Project Presentations		