New York University Tandon School of Engineering

Thursday 12:25 – 2:55 PM; 2 MTC Rm 9009

To contact professor: treddington@nyu.edu
2 Metro Tech Center, Rm 10.089
Office hours: by appointment

Graduate Assistants
Vatsal Shah vds254@nyu.edu
Bhushan Manohar Newalkar bmn258@nyu.edu

Programming Languages

Description:
This course covers the structures, notations and semantics of multiple programming languages. Topics: Issues of scope, type structure and parameter passing. Control structures, including support for exception handling and concurrency. Abstract data types and object-oriented languages. Functional, logic programming languages. Examples from a variety of languages will be used especially the newer concepts that are appearing.
This is not a class on any one programming language but a class on a series of concepts that underlie one of more programming languages. We will focus for instance, on c, C++, Python3, Lisp/scheme, Haskell AspectJ and Prolog. I will provide documentation on each, You are expected to learn each language and demonstrate through your homework that tou understand concepts.

Learning Objectives
Understand different concepts and constructions across multiple programming languages
Be able to critique how one language provides support for a concept versus another language.
Learn imperative, functional, logic, Aspect Oriented and Object-Oriented programming languages.

Perquisites
CS-GY 5403
Be familiar with Linux and c.

Textbook
Robert W. Sebesta, Concepts of Programming Languages (10th ed.) (Supplied pdf)
Kent Lee, Foundations of Programming Languages (Supplied)
A Linux Virtual Machine (VM) will be provided that has languages preinstalled. Class exercises will be done on this VM. It will be preloaded with flex, python, python3, swi-prolog, lisp, c & C++, and Haskell, Julia, ocaml, php, ruby, bison, golang, fortran, mit-scheme, clojure1.6, smlnj, aspectj.

Lessons
Homework is the key to success in this course. There will be assignments that are done in the VM and results captured. There may also be writing assignments. You are responsible for reading Chapters 1 and 2 of Sebesta on your own.
A rough schedule of topics/chapters: (These may change as the semester progresses).

Lectures	Date	Assignment	Topics
1	6-Sep	Ch 3	Introduction; VLAB; BNF/Flex, Parse Trees
2	13-Sep	Ch 4	Parse Trees
3	20-Sep		Lexical and Syntatic Analysis; Perti Nets
4	27-Sep		Lambda Calculus
5	4-Oct	CH 15, Haske	Funcational Programming Languages, Haskell
6	11-Oct	Ch15, Python	Funcational Programming Languages, Python3
7	18-Oct		Lisp, Scheme
8	25-Oct	Midterm	
9	1-Nov	Ch 6	Object Oriented Programming, Method Resolutio
10	8-Nov	Ch 16	Closures, Decorators, Advice, Aspect Oriented Pro
11	15-Nov	Ch 8	Logic Programming
12	22-Nov		Thanksgiving Break
13	29-Nov	CH 9,10	Subprograms, Implementing Subprogrms
14	6-Dec	Ch 11, 12	Encapsulations Concepts C++, Python3, Haskell
15	13-Dec	Ch 13, 14	Exception Handing, Generic Functions
16	20-Dec	Final Exam	Final Exam

Grading
40% Homework
30% Midterm exam
30% Final exam

Policies:
The exact topics listed in this syllabus are subject to change. As the class progresses we will gauge where your interests lie and may adjust topics and schedule appropriately.

All homework and laboratory assignments are due on the date indicated on the course website. **Late assignments will not be accepte**d so don't ask for an extension if you are late. Failure to submit an assignment will result in a grade of zero for that assignment. You will have ample time from the time an assignment is given until it is due. We will not consider a network outage, unavailability of your computer or a computer in the lab (whether a specific computer or any computer in general), or other computer problem that occurred the night before the due date to be a justification for submitting an assignment late. You may assume that there will be one lab and/or homework for each lecture.

Individual Work and Collaboration
In preparing your submissions for homework and laboratory projects you are authorized to use the textbook, your notes, web sites, on-line documentation and any other reference materials to which you have access. You may also discuss the assignment in general with other members of the class or with anyone else whom you believe can be of assistance (including possibly the instructor).
The work that you submit for grading **must**, however, be exclusively your own work. If you do obtain assistance from another individual, you must include an explicit note to that effect in your submission for the assignment. Further all references used must be cited. This means that if you are using various web sites for assistance in laboratory assignments and/or homework you must cite the exact URLs. In addition, any other printed material used must be explicitly cited.
See: https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/academic-integrity-for-students-at-nyu.html

Cheating & Plagiarism
Cheating or plagiarism on a lab or homework will result in a zero and the Computer Science department will track you going forward for subsequent infractions.. Cheating on an exam is a much more serious infraction and may result in a lower grade for the course or an F.

Moses Center Statement of Disability
If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.