Department of Computer Science and Engineering
University of Notre Dame

Syllabus
CSE 10101/CDT 30391: Script-Based Programming I
Pilot Offering: Spring 2015
TR 2:00-3:15, 125 DBRT

Instructor: Prof. Patrick Flynn, 631-8803, flynn@nd.edu, @ProfFlynn; OH: MW 4-5pm, WR 11-noon
Graduate TA: Nicole Shaffer, nshaffe1@nd.edu; OH: TBA
Undergraduate TA: Shuyang Li; OH: TBA

Prerequisites: None.
Textbook: *Python for Informatics: Exploring Information* by Charles Severance; the book is freely available online in multiple formats at **http://goo.gl/gJLbPN** . Much of Severance's book (and almost all of the material we will cover in CSE 10101) is a remix of *Think Python* by Downey *et al.*, also freely available at **http://goo.gl/oJxDu** .

Description: Introduction to programming. Programming structures suitable for basic and intermediate computation. Elements of computer organization and networking. Development of programming skills including data manipulation, multimedia programming, and networking. Standards for exchange and presentation of data. Comprehensive programming experience using Python.

This course is required of all students in the new Computers and Digital Technologies (CDT) program, and is an elective for the old Computer Applications (CAPP) program. No prior programming experience is required. <u>Students with significant programming experience should not take this course</u>. The course is not intended to familiarize experienced programmers with a new language.

Topics (high level)
1. Elements of computer organization: processing, storage, networking, and application structure.
2. Basic computations and language syntax.
3. Using libraries and APIs.
4. Web services.
5. Basic techniques for obtaining/generating data, computing with data, and visualization of data.

Environment: This course will employ the Python (version 2.7) scripting language and its associated ecosystem, including IPython, to

present language elements and provide a notebook capability for script development. There are multiple "environments" available for Macintosh, Windows, and Linux systems to run the IPython notebook interface, but the best is probably Anaconda, available for free from this web link: https://store.continuum.io/cshop/anaconda/ . **You are required to bring a laptop computer so that programming work can be done during the class meetings.** If some sort of hardship prevents you from bringing a laptop, please contact the professor so that alternate arrangements can be made. From time to time, students will be asked to screencast their notebooks so that we can solve problems and learn new things together.

Lecture Capture Notification: Notre Dame is testing a lecture capture system. This system allows us to record and distribute lectures and other audio and video recordings to you in a secure environment. Because we will be recording in the classroom, your questions or comments may be recorded. Video recordings will typically only capture the front of the classroom. If you have any concerns about your voice or image being recorded, please speak to the instructor to determine an alternative means of participating. No material will be shared with individuals other than those enrolled in the class and faculty/staff who require access for support or specific academic purposes without your express permission. You may watch recordings on your computer, tablet or smartphone. These recordings are jointly copyrighted by the University of Notre Dame and your instructor. Posting them (or excerpts from them) to any website or online service, including YouTube, Facebook, Vimeo, or any other site without express, written permission may result in disciplinary action and possible civil prosecution.

Evaluation: grades will be based on student performance on the following items:
1. Assignments (some in-class, some out-of-class) (50%)
2. Comprehensive midterm exam (25%), to be held Tuesday March 3.
3. Comprehensive final exam (25%), to be held Thursday, May 7, 10:30-12:30.

The grading scale is as follows: 92.0-100.0 is an A, 90.0-91.99 is an A-, 88.0-89.99 is a B+, 82.0-87.99 is a B, 80.0-81.99 is a B-, 78.0-79.99 is a C+, 72.0-77.99 is a C, 70.0-71.99 is a C-, 62.0-69.99 is a D, and 0.0-61.99 is an F.

Attendance will be taken from time to time, and the attendance record may be a factor in resolving borderline grades.

Assignments will encourage and require the acquisition of programming knowledge and its application to well-defined computing problems of increasing complexity. Later assignments will encourage creativity in solutions and evaluation.

Academic Honor Code: You signed this pledge as a condition of admission to the University:

> *As a member of the Notre Dame community, I will not participate in or tolerate academic dishonesty.* `(http://honorcode.nd.edu/)`

Hence, the fundamental instruction on academic dishonesty is "Don't claim credit for other people's work; don't allow your work to be used as someone else's claim for credit; and don't tolerate instances of such theft that come to your attention." In this class, discussion of assignments is encouraged, but do not work together on the software that implements your solution. **There are no opportunities for graded group work in this class.** Although there may be a gray area relating to "discussion of assignments" or "using online resources to learn how to solve a problem", you run a risk if **you** define its boundaries. If you are uncertain whether a specific approach to your work is allowable under the Honor Code and the expectations in this class, it is **always** better to talk to the professor about it. The TAs will not be allowed to rule on academic honesty matters so please don't ask them to do so.

Weekly topics (subject to change based on pacing)
- 1/13 & 1/15: Intro, overview, example, data types (Ch 1, 2)
- 1/20 & 1/22 (PF traveling, Nicole will lecture): data types, variables (Ch 2)
- 1/27 & 1/29: variables, conditionals, iteration (Ch 2, 3)
- 2/3 & 2/5: conditionals, functions (Ch 3, 4)
- 2/10 & 2/12: Functions and more iteration (Ch 4, 5)
- 2/17 & 2/19: Iteration and strings (Ch 5, 6)
- 2/24 & 2/26: Strings (Ch 6) (guest lecture from Prof. Wilkens on 2/26)
- 3/3: midterm exam; 3/5: recap.
- 3/17 & 3/19: File I/O (Ch 7)
- 3/24 & 3/26: File I/O and lists (Ch 7, 8)
- 3/31 & 4/2: Lists and dictionaries (Ch 8, 9)
- 4/7 & 4/9: Dictionaries, tuples, (Ch 9, 10) (guest lecture from Prof. Villano, 4/7, tentative).
- 4/14 & 4/16: Standard libraries: text processing (Ch 11, 12)
- 4/21 & 4/23: Standard libraries: web services (Ch 13, 14) (guest lecture from Prof. Bualuan 4/23)
- 4/28: wrap up.
- 5/7: Final exam, 10:30am-12:30pm