SYLLABUS
ISE 314X Computer Programming for ISEs
Fall 2017, 4 Credits
Aug. 23, 2017 - Dec. 08, 2017
Lectures: 1:10pm - 2:35pm MW, UU209
Lab Sessions: 2:45pm - 3:45pm MW, EB-Q23 (Optional)

1. Instructor
Dr. Yong Wang
Office: EB-T10
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Email: yongwang@binghamton.edu (preferred way of communication)
Office Hours: 2:45pm-3:45pm MW and by appointment

2. Teaching Assistant(s)
Dieudonne Ouedraogo (douedra1@binghamton.edu)
Office: Same as the lab.
Office Hours: Same as the lab sessions and by appointment.

3. Course Description
Computer programming becomes an essential tool for problem solving across multiple disciplines. This course provides an introduction to computer programming, with an emphasis on its applications in industrial and systems engineering (ISE). Python for scientific computing will be taught in this course. Students will be better prepared for future employment and academic opportunities through establishment of this base in computer programming.

4. Textbooks
- (Required) Python Programming: An Introduction to Computer Science, 3rd Edition
  Author: John Zelle
  Publisher: Franklin, Beedle & Associates Inc. (2017)
  ISBN-13: 978-1590282755
- (Recommended) Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython
  Author: Wes McKinney
  Publisher: O'Reilly Media; 1 edition (2012)
  ISBN-13: 978-1449319793

Due to the popularity of Python, abundant documents and learning materials are available on the Internet. Some of the creative commons/open source materials will be introduced in this course.

5. Course Format and Credit Hours
Course materials will be presented in class lectures. Attendance at the lectures is required. There will be two lab sessions each week. Attendance at the lab sessions is optional. However, students are highly encouraged to practice the code learned from the lectures during the lab sessions, and the TA will be available to help. Students are encouraged to bring in their own laptops to class and lab.

6. Prerequisites

- Linear Algebra, Calculus, and Probability
- iClickers will be required for this course

7. ABET Learning Outcomes
This course will help students achieve the following ABET learning outcomes:
- (a) - An ability to apply knowledge of mathematics, science, and engineering
- (k) - Ability to use the techniques, skills and modern engineering tools necessary for engineering practice

8. Course Outline and Examples
The course materials are divided into two parts:
- Part I (First half of the semester):
    - Python (basic syntax and programming principle)
- Part II (Second half of the semester):
    - NumPy (matrix and linear algebra)
    - SymPy (calculus and symbolic operation)
    - MatPlotLib (data visualization)
    - Pandas (data analysis and statistics)
    - PyQt and Qt Designer (GUI programming)
    - SciPy and PuLP (optimization)
    - Scikit-Learn (machine learning)
    - SQLite3 (database programming)

Examples from the following areas are included in this course:
- Operations research
- Data mining
- Machine learning
- Time series analysis
- Monte Carlo simulation
- Neural networks
- Social networks

9. Course Components and Grading
Homework will be assigned on a regular basis. Occasional, possibly unannounced in-class quizzes will be arranged throughout the semester. Homework assignments are required to be turned in electronically on MyCourses. Late homework will not be accepted. There will be an in-class midterm exam. Missed quizzes and exams will not be made up (unless pre-approved by instructor with an acceptable reason). The final exam will be in form of a course project. Project requirements will be announced after the midterm exam. The weights of course components are as follows:
- Homework (Group Work) and Quizzes (Individual Work) 30%
- Midterm Exam 30% (Individual Work)
- Final Project (programs, report, and presentation) 30% (Group Work)
- Attendance and Participation 10% (Individual Work)

The following system from BU Student Records & Registrar Services will be used to convert weighted total grades to equivalent letter grades and GPA:

- Weighted Total ≥ 90 A   4.0
- $87 \leq$ Weighted Total < 90 A$-$ 3.7
- $83 \leq$ Weighted Total < 87 B+   3.3
- $80 \leq$ Weighted Total < 83 B   3.0
- $77 \leq$ Weighted Total < 80 B$-$ 2.7
- $73 \leq$ Weighted Total < 77 C+   2.3
- $70 \leq$ Weighted Total < 73 C   2
- $67 \leq$ Weighted Total < 70 C$-$ 1.7
- $60 \leq$ Weighted Total < 67 D   1.0
- Weighted Total < 60 F   0.0

The following grade review policy will apply:
- Grades will be posted on MyCourses about one week after the assignment is turned in.
- Quiz and exam papers will not be returned to students. Solutions will not be posted on MyCourses. Students are encouraged to check their papers and review the solutions with the TA.
- If you are not satisfied with the TA's answer, you are welcome to talk to the Instructor.

10. BMail & MyCourses
Most course materials will be posted on MyCourses or distributed via BMail AFTER each lecture. Students are responsible for checking MyCourses and BMail regularly. Students who wish to get a sneak peek of the course materials before the lectures can do so by reading the textbook. **Do not post distributed course materials to other websites without written permission from the instructor.**

11. Classroom Policies
Laptop computers, tablets, and smartphones can be major sources of distractions if used inappropriately during class. The instructor understands that different students have different styles of learning. Legit use of such devices in class such as taking notes, checking course materials, or coding practice is allowed. Talking on the phone, sending and receiving messages, checking Facebook or Twitter, watching YouTube videos and the like are prohibited. Class will be monitored by the TA, who sits in the back of the classroom. Each violation will lead to a 1% deduction from the semester total.

Students are encouraged to ask questions in class. Discussions with classmates are also allowed. However, respect each class member's right to learn and the teacher's right to teach. When the instructor starts to talk, students shall quiet down.

12. Academic Honesty

Students are required to abide by Binghamton University's policy on academic honesty listed in the University Bulletin. Cheating or plagiarism will result in a grade F in the course and the event will be reported to the University.

13. Other Notes

Suggestions for teaching improvement are welcome at any time. Students with special accommodation needs are advised to contact the instructor within the first two weeks of the course. Students who are experiencing undue personal or academic stress at any time during the semester or need to talk with someone about a personal problem or situation are encouraged to seek support as soon as possible. The instructor is available to talk with students about stresses related to the coursework in this class. The instructor can also assist students in reaching out to a wide range of campus resources. Some links to campus resources are as follows:

- University Calendar
- Undergraduate Grading System
- Grading System of the Graduate School
- Student Academic Honesty Code
- Services for Student with Disabilities
- University Tutoring Services
- ITS Helpdesk
- MyCourses Support
- University Libraries
- Dean of Students
- University Counseling Center
- University Police