IENG 331: Computer Applications in Industrial Engineering
Fall 2018

Course Information

IENG 331: Computer Applications in Industrial Engineering (Fall 2018)
Class Schedule: Tuesday/Thursday 11:00 AM - 12:15 PM
Class Location: Engineering Sciences Building G78B
Final Exam: Thursday, December 13, 8:00 AM - 10:00 AM

Introduction to computer applications in industrial engineering: emphasis on system design and analysis and the role of computers in productivity improvement.

Instructor

Behrooz Kamali, Ph.D.
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Office hours: Tuesday 9:00 - 10:45 AM, Thursday 12:30 - 13:45 PM, or by appointment

Teaching Assistant

Behnam Torkjazi
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Office: Engineering Sciences Building (ESB) 305
Office hours: Monday/Wednesday 10:00 AM - 12:00 PM, Friday 12:30 PM - 2:30 PM

References

There is no required textbook for this class. We use the following two resources throughout the course.

- How to think like a computer scientist, `http://openbookproject.net/thinkcs/python/english3e/`
- The python language reference, `https://docs.python.org/3/reference/index.html`

Other useful resources:

- Python crash course: a hands-on, project-based introduction to programming. Matthes, Eric. No Starch Press, 2015.
- Python data science handbook: Essential tools for working with data. VanderPlas, Jake. O'Reilly Media, Inc., 2016.

Prerequisites

ENGR 102 - Engineering Problem-Solving 2

Course Objectives

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

1. Implement the fundamentals of computer programming using Python
2. Recognize common data structures and their applications
3. Develop and debug programs for automating analytical operations
4. Use libraries for handling, cleaning, analyzing, and visualizing data
5. Perform basic scientific computing operations
6. Connect to and query external data-sets and databases

Course Relationship to Program Educational Outcomes

Students will be able to understand and apply various number systems and data representation schemes used on digital computers. Students will be able to design, implement, and debug computer programs using one and two dimensional arrays, data structures and databases (Outcome 1).

Students will be able to understand and apply various number systems and data representation schemes used on digital computers. Students will be able to design, implement, and debug computer programs using one and two dimensional arrays, data structures and databases (Outcome 2).

Grading

Each homework has 4 points, with the total of $12 \times 4 = 48$ points. Two lowest grades will be dropped, making total homework grades 40.
Each exam has 20 points, with the total of $3 \times 20 = 60$ points.

RANGE	GRADE	RANGE	GRADE
97 - 100	A+	73 - 76	C
93 - 96	A	70 - 72	C-
90 - 92	A-	67 - 69	D+
87 - 89	B+	63 - 66	D
83 - 86	B	60 - 62	D-
80 - 82	B-	0 - 59	F
77 - 79	C+		

Course Topics and Tentative Schedule

Week	Topics
1	Programming fundamentals
2	Variables, data types, and operators
3	Flow control (Homework 1)
4	Functions (Homework 2)
5	Data structures (Homework 3)
6	Files & modules (Exam 1)
7	Classes & objects (Homework 4)
8	Dictionaries & exceptions (Homework 5)
9	Advanced data structures (Homework 6)
10	Data analysis I (Homework 7)
11	Data analysis II (Homework 8)
12	Data visualization I (Exam 2)
13	Data visualization II (Homework 9)
14	Scientific computing (Homework 10)
15	Database management systems I (Homework 11)
16	Database management systems II (Homework 12)

Academic Integrity

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Catalog at `http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification/#academicintegritytext`. Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.

Attendance

Student attendance is mandatory, unless excused by the instructor. The basis for an excused absence will follow the university policy. No credit will be given for attendance. However, class participation and attendance can affect the final grade in borderline cases.

Exams

All exam problems demand both answers and work showing the complete solution procedure for full credits. The exams will be cumulative. Make-up tests will be given if (i) a legitimate,

documented excuse is provided (e.g. personal sickness, emergencies, or university-related trips), and (ii) the excuse and supporting documentation are provided either prior to the test date or no more than one week after you are able to take the test. Make-up tests will not be given if these conditions are not met.

Homework

Homework is assigned as individual work unless specifically stated otherwise. Students are allowed to discuss assignments among themselves; however, each student must submit her/his own work. Assignments must be submitted by the start of class, unless prior arrangements have been made with the course instructor. Late submission of the assignment will result in losing 30% of the full assignment grade per day.

Regrade

Requests for regrades of exams and homework assignments must be submitted to the course instructor, in writing, within SEVEN days of the date the work was returned to the student. The instructor reserves the right to regrade any other section of the work as deemed appropriate.

Communication

Course announcements, information, assignments, and documents will be posted on eCampus. Students are expected to check email and eCampus regularly.

Statement on Social Justice

West Virginia University is committed to social justice. I concur with that commitment. I expect to foster a nurturing learning environment that is based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, you must make appropriate arrangements through Disability Services (293-6700). They will identify the nature of the accommodation your disability requires.