SYLLABUS
IE 2990: Fundamentals and Engineering Applications of Programming with Python

INSTRUCTOR:	Haifeng Wang, Ph.D.
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CLASS TIME AND LOCATION:	-**T, R: 02:00PM - 03:15PM (LOCATION: WALKER 304)** (Face to face sections) -Recorded videos (Asynchronous online)
OFFICE HOURS:	T, R: 10:00AM - 11:30AM (McCain 260P) or by appointment
WEBSITE:	canvas.msstate.edu Lecture video access https://oc-engage.engr.msstate.edu/engage/ui/index.html

CATALOG DESCRIPTION

(Prerequisite: IE 4613: Engineering Statistics I or equivalent). Three hours lecture. An introduction to Python programming for use in engineering applications. This course covers minimal theory and focuses mainly on the coding aspects of using Python. The topics will include the foundation of Python programming, computational tools, data aggregation, visualization, and simple regression and classification algorithms.

COURSE OBJECTIVES

- To learn and practice the fundamentals of Python programming as a computational tool for engineering applications.
- Understand and be able to design data preprocessing programs to support engineering analyses.
- To be able to solve simple data analytics problems on real problem datasets.
- Gain basic programming and knowledge skills in data science.

COMMUNICATION

Website: canvas.msstate.edu. Course announcements and communication will be sent via CANVAS email. Students are responsible for checking their email frequently.

TEXTBOOKS

McKinney, Wes. *Python for Data Analysis, 3rd Edition*. O'Reilly Media, Inc., 2022. (Not required)
E-book link: https://wesmckinney.com/book/

Operating system SOFTWARE

- Window 10/11 Or macOS
- Python 3. All examples provided will be coded in Python.
- Anaconda (https://www.anaconda.com/distribution/, free) or PyCharm (https://www.jetbrains.com/pycharm/, free)

GRADE DETERMINATION

- Assignments   35%
- Midterm Exam   30% (tentatively March 19th Tuesday)
- Final Project   30%
- Participation   5%

Final letter grades will be determined:

A	100%	to	90%
B	< 90%	to	80%
C	< 80%	to	70%
D	< 70%	to	60%
F	< 60%	to	0%.

Grades will be posted on-line. Disputations of assignment or exam grade should be discussed with the professor within one week from the date the grade is submitted. As a note: A request for grade review will result in a complete regrading of the assignment or exam, not only those items in the request.

Exam (30%): There will be one take-home exam midterm (30%). No make-up exams will be given without a university documented excuse.

Project (30%): There will be one final project (30%). Each project will be based on a real dataset to perform analysis and report results. The final submission should include code (15%) and a project report (15%) to discuss your analysis process and results (up to four pages, Times New Toman, font size 12, single-spaced). The final project will be on an agreed topic. More details will be provided in the lecture. Each final project can include at most two students, could be an individual effort.

Assignments (35%): There will be five assignments. The assignments will contain written questions and questions that require some Python programming. The assignment is due at 12pm (noon) on the due date (more details will be noticed in each assignment). A 15% penalty will be assessed for assignments submitted by 5pm on the day the assignment is due. No credit will be given for an assignment that is turned in after 5pm on the day that it is due (unless it is the result of an officially excused absence). Assignments should be submitted online. Emailing assignments is unacceptable unless a prior arrangement is made with the instructor.

Participation (5%): Class attendance (on-campus students) and CANVAS discussions (both distance and on-campus students) will be considered for participation. Please refer to AOP 12.09 regarding attendance expectations and accommodations. For on-campus students, excessive unexcused absences will result in a deduction to their participation grade as follows:

- 0-3 unexcused absences: 0% deduction
- 4-6 unexcused absences: 20% deduction
- 7-9 unexcused absences: 50% deduction
- 10+ unexcused absences: 100% deduction

Excused Absences Policy: There will be an allowance for excused absences in participation, late assignments, and make-up work in accordance with MSU AOP 12.09.

Working Together: It is ok to ___discuss___ assignments with other students. However, when it comes time

for you to write up the solutions/codes, I expect you to do this on your own. Working together or using other outside sources on exams is expressly forbidden.

EXPECTED TOPICS COVERED

Topics Covered	Contact Hours (45)
Module 1: Introduction to Python	
Why Python?	2
Install Python and Jupyter Notebook	3
Python syntax rules	3
Python data types	2
Object	1
Module 2: Basic Python Programming	
Control structures	3
Module, package, library	2
NumPy	3
SciPy	2
Matplotlib	3
Module 3: Computing Packages	
Reading data using pandas	2
Data frame methods	3
Data aggregation	3
Data visualization	3
Module 4: Engineering Applications	
Cancer disease diagnosis	3
Process anomly detection	3
Exam	2
Project	2

UNIVERSITY SYLLABUS STATEMENT

"The Mississippi State University Syllabus contains all policies and procedures that are applicable to every course on campus and online. The policies in the University Syllabus describe the official policies of the University and will take precedence over those found elsewhere. It is the student's responsibility to read and be familiar with every policy. The University Syllabus may be accessed at any time on the Provost website under Faculty and Student Resources and at https://www.provost.msstate.edu/faculty-student-resources/university-syllabus"