

Course Syllabus: DATA 1301-001

Introduction to Data Science: Fall 2018

Instructor: Li Wang

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Office Hours: Tuesday/Thursday: 3:00pm-5:00pm or by appointment

Faculty Profile: <https://mentis.uta.edu/explore/profile/li-wang>

Section Information: MATH 1301-001

Time and Place of Class Meetings: Lecture: LS 424 Tu/Th 12:30PM - 1:50PM

Description of Course Content: This course is an introduction of data science. Firstly, we will introduce some basic data structures: sets; functions; sequences; sums and matrices. Secondly, we will introduce graphs and graph models, which are popularly used in data visualization. Thirdly, we will introduce basic Python programming, including: Lists; sets; Numpy, Pandas and Matplotlib. Lastly, we will introduce four machine learning algorithms: Linear regression; K-nearest neighbors; K-means and random forest.

Prerequisite: N/A.

Student Learning Outcomes: Upon completion of DATA 1301-001, the students will:

- (1) understand the meaning of some basic data structure and representation methods;
- (2) know how to represent data using graphs;
- (3) can write simple python programming code;
- (4) learn basic and most popularly used machine learning algorithms.

Required Textbooks and Other Course Materials:

1. No textbook is required.
2. Personal computer/laptop is required for implementing some code.

Descriptions of major assignments and examinations: There is no in class exam for this course.

Three small projects will be required to finish at home and submit online. There is weekly practice homework post on blackboard and submit online.

Attendance: At the University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. **As the instructor of this section, I have decided that attendance at all class lectures is required.** Any student who misses a lecture for any reason is responsible for missed material and missed announcements. While UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

Grading Scale: A: 90-100 B: 80-89 C: 70-79 D: 60-69 F: 0-59

Grade Components and Major Assignments and Examinations:

Homework: 20%
Midterm 1 Project: 20% (due in Week 6 Thursday)
Midterm 2 Project: 20% (due in Week 11 Thursday)
Final Exam Project: 30% (due in Week 16 Thursday)
Class Attendance: 10% (In class signature)

Expectations for Out of Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time on focused course-related activities, including reviewing class lecture note, completing homework, and finishing assigned projects.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. **Students are responsible for providing the instructor with official notification in the form of a letter certified by the Office for Students with Disabilities (OSD).** Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence. I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

Electronic Communication: UT Arlington has adopted **MavMail** as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as "lecture," "seminar," or "laboratory" are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback via the SFS database is aggregated with that of other students enrolled in the course. Students' anonymity will be protected to the extent that the law allows. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include [tutoring](#), [major-based learning centers](#), developmental education, [advising and mentoring](#), personal counseling, and [federally funded programs](#). For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

University Tutorial & Supplemental Instruction (Ransom Hall 205): UTSI offers a variety of academic support services for undergraduate students, including: 60 minute one-on-one [tutoring](#) sessions, [Start](#)

Strong Freshman tutoring program, and Supplemental Instruction. Office hours are Monday-Friday 8:00am-5:00pm. For more information visit www.uta.edu/utsi or call 817-272-2617.

IDEAS Center: The IDEAS Center (2nd Floor of Central Library) offers free tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817)272-6593.

The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. <http://library.uta.edu/academic-plaza>

Math Clinic: The Math Department operates the Math Clinic, a tutoring service staffed by upper level undergraduate students. You will need to show your MavID to use the Math Clinic. There are tables where you may study on your own or quietly with other students. The Math Clinic is on the 3rd floor of Pickard Hall (Room 325); the phone number is 817-272-5674; and the hours of operation for fall are

Monday – Thursday 11:30am – 8:00pm

Friday, Saturday, Sunday Closed

Go to the Math Clinic webpage <http://www.uta.edu/math/clinic/> to get more information.

Private Tutor List: The Math Department maintains a list of people who have expressed an interest in tutoring. These persons are not necessarily recommended by the Math Department and they set their own fees. You may obtain a copy of the tutor list in the Math Office.

Course Schedule (Tentative):

Week	Topics
1	Introduction to DATA 1301; Syllabus; exam requirement etc.
2	Basic Structures: Sets, Functions, Sequences.
3	Basic Structures: Sums, and Matrices.
4	Graphs and Graph Models, connectivity, degree.
5	Trees, minimal spanning tree.
6	Introduction of Python Programming: Installation and Jupyter, Anaconda
7	Introduction of Python Programming: List; strings; range(); If statement
8	Introduction of Python Programming: Sets; Tuples; Random function; dictionary
9	Introduction of Python Programming: Numpy: Multiarray
10	Introduction of Python Programming: Pandas: Series; DataFrame
11	Introduction of Python Programming: Matplotlib: data visualization
12	Machine Learning: Linear Regression
13	Machine Learning: K-nearest Neighbors (KNN)
14	Machine Learning: K-means
15	Machine Learning: Random Forest

Li Wang, who is the instructor of this course, reserves the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381