

IS 471/MIS 671 – Big Data

Department of	Management, Entrepreneurship, and Technology
College of	Lee Business School
Course Location:	CBC C125
Class Meeting Days & Times:	Thursdays 7:00 P.M. – 9:45 P.M.
Course Abbreviation/ Number/	IS 471 (Big Data; course number: 27397) / MIS 671 (Big Data; course number: 27359)
Prerequisites:	Lee Business School major or Information Management minor and IS 372.
Required Text/Resources:	<ul style="list-style-type: none"> • Mining of Massive Datasets, by Leskovec, Rajaraman, and Ullman Cambridge University Press, 2014 Download textbook: http://infolab.stanford.edu/~ullman/mmds/book.pdf • Aster Express download: https://aster-community.teradata.com/community/download • Teradata Studio download: https://downloads.teradata.com/download • IBM BigInsights Download: http://www.ibm.com/developerworks/downloads/im/biginsightsquick/ • Other materials may be assigned as required
Access to Learning Resources:	<ul style="list-style-type: none"> • Teradata Student Network: http://www.teradatastudentnetwork.com <ul style="list-style-type: none"> ○ Register using the student password: "Analytics" • IBM BigInsights Tutorials <ul style="list-style-type: none"> • http://www.ibm.com/support/knowledgecenter/SSPT3X_4.2.0/com.ibm.swg.im.infosphere.biginsights.tut.doc/doc/tut_Introduction.html • http://www-01.ibm.com/software/data/infosphere/biginsights/quick-start/tutorials.html • Teradata Aster <ul style="list-style-type: none"> ○ https://aster-community.teradata.com/community/learn-aster
Course Description:	
Introductory course to big data concepts, tools and methods. Students will be exposed to and work with big data sets and derive business solutions from their analyses.	
Course Overview:	
Historically, large volumes of structured data have been mainly collected, stored and mined using traditional and relational data warehousing technologies. However, the astounding growth of data in all aspects of life in the form of emails, weblogs, tweets, sensors, video and text has necessitated the use of Big Data Analytics to support large scale data analytics.	
This course brings together key Big Data tools on a Hadoop platform to efficiently manage data with three main characteristics; volume, velocity and variety. We will learn about the Hadoop platform, the so called NoSQL HBase storage solution and other tools in the Hadoop ecosystem. Students would be introduced to the core concepts, technologies and techniques of big data analytics so they can gain the necessary skills needed to design highly scalable data analytics systems.	

Learning Objectives:

1	Students will have developed knowledge, skills and understanding around a range of subjects in the field of big data analytics.
2	Students will understand techniques for storing and processing large amounts of structured and unstructured data.
3	Students will be able to design and build big data applications through highly scalable systems capable of collecting, processing, storing and analyzing large volumes of data.
4	Students will be able to apply concepts and principles from science and business to analyze and interpret using analytic and computer-based techniques.
5	Students will understand how to effectively interpret and communicate their ideas through written and oral reports.

Course Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

Item	Value (points)	Individual/Group
2 Exams at 100 points each	200 points	Individual
8 Class Assignments at 25 points each	200 points	Individual
Group Term Project	100 points	Group
Total:	500 points	

Grade Determination:

A ($\geq 93\%$)	A- (90-92.99%)	B+ (87-89.99%)	B (83-86.99%)
B- (80-82.99%)	C+ (76-79.99%)	C (72-75.99%)	C- (70-71.99%)
D+ (66-68.99%)	D (62-65.99%)	D- (60-61.99%)	F (< 60%)

Note: Final decimal percentages will be rounded off to the nearest integer before calculating the letter grades. For example, if the final course percentage is 92.8, it will be rounded off to 93% and the student will receive an A. Again, if the final course percentage is 92.2, it will be rounded off to 92% and the student will receive an A-.

Course Procedures**Web Campus**

The course shall use webcampus portal. This portal will have the resources related to the course, e.g. powerpoints, reading materials, posted syllabus, assignments etc.

You will be required to log in into this portal to access your course.

Groups

- For the group project, you will work in groups of max 4 members.
- You should choose groups and notify the instructor regarding your group by the **date noted in the course schedule**. However, the instructor reserves the right to re-assign you to a different group.
- Once groups are chosen, they cannot be changed without the instructor's permission.
- Please make sure you are aware of your groups and your group members.

Class Attendance

- Class attendance is important and will be a critical factor for doing well in this course. Given that this course is heavily hands-on, class attendance is critical.
- Also, there shall be class assignments (see course calendar) that will be due in class.

Class Assignments

- Class assignments are in class and are to be submitted by end of class on the due day
- They need to be turned in individually
- You can consult resources while doing the assignments
- The assignments will vary in structure. Some will be from Big Data University and you will be able to print a certificate and/or add a badge to your LinkedIn profile. Uploading the certificate/Badge is the deliverable for the assignment.

- Others would be traditional lab assignments where you will have to upload your work
- To be uploaded on webcampus by the end of class on the due day

Do not miss any assignment. ***If you miss an assignment without a valid excuse, then your grade in that assignment will be zero.*** If an assignment is missed, it is the student's responsibility to (a) contact the professor as soon as possible via email, telephone or in person, (b) produce a document describing the valid reason for having missed the assignment. Examples of valid excuses are serious illness and participation in University sponsored events. If you miss an assignment due to illness, a written excuse from a doctor is necessary. When you have to miss an assignment due to participation in a University sponsored event, you must inform me prior to the assignment and submit appropriate documentation to verify your claim. When you miss an assignment for a valid reason, contact your professor with **valid documentation** within 7 days of the missed test. ***No makeup assignments are ordinarily given.***

Exams and Exam Policy

There are 2 exams: 1 mid-term and the final (see schedule). All scheduled exams will be taken on computers in the classroom.

- The exams are closed books and closed notes.
- Examinations will be administered during the scheduled days (please check course calendar) in class via webcampus.
- All exams are individual components.

Do not miss any exam. ***If you miss an exam without a valid excuse, then your grade in that exam will be zero.*** If an exam is missed, it is the student's responsibility to (a) contact the professor as soon as possible via email, telephone or in person, (b) produce a document describing the valid reason for having missed the exam. Examples of valid excuses are serious illness and participation in University sponsored events. If you miss an exam due to illness, a written excuse from a doctor is necessary. When you have to miss an exam due to participation in a University sponsored event, you must inform me prior to the exam and submit appropriate documentation to verify your claim. When you miss an exam for a valid reason, contact your professor with **valid documentation** within 7 days of the missed test. ***No makeup exams are ordinarily given.***

Group Term Project

- The Term Project is a group-based assignment.
- Grading is team-based for this assignment.
- Full points for this project would be 100.

Student groups should propose a big data collection process and analysis (sources, tools, statistical concepts, etc.) that can be used to solve a business problem, or to create an innovation that could lead to a new venture. Successfully conducting the analysis will be a significant bonus.

Academic Misconduct

Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution.

An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the *Student Academic Misconduct Policy* (approved December 9, 2005) located at: <http://studentconduct.unlv.edu/misconduct/policy.html>.

Copyright

The University requires all members of the University Community to familiarize themselves and to follow copyright and fair use requirements. **You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws.**

Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://provost.unlv.edu/copyright/statements.html>.

Student academic appeals policy

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance the student has a right to appeal by the procedure listed in the Undergraduate Catalog.

Disability Resource Center

The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your

Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Religious Holidays Policy

Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor **within** the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or **within** the first 7 calendar days of the course for summer and modular courses, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

Tutoring and Coaching

The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

Rebelmail

By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. **Emailing within WebCampus is acceptable.**

UNLV Writing Center

One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: <http://writingcenter.unlv.edu/>.

Transparency in Learning and Teaching

The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information:

<https://www.unlv.edu/provost/teachingandlearning>

<https://www.unlv.edu/provost/transparency>

Incomplete Grades

The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Library

Students may consult with a librarian on research needs. For this class, the subject librarian is https://www.library.unlv.edu/contact/librarians_by_subject. UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at <https://www.library.unlv.edu/>.

Final Examinations

The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: <http://www.unlv.edu/registrar/calendars>.

Course Calendar: May be updated based on our progress in the class

WK	Dt.	Topic	Related Material/Tasks due
1	Jan 19	Syllabus and Introduction The relevance of Big Data; why Big Data?	http://ecorner.stanford.edu/videos/3223/Opportunities-Abound-in-the-Big-Data-Space-Entire-Talk
2	Jan 26	Big Data: Concepts, Technologies, and Applications	Assignment 1
3	Feb 2	Big Data Case Studies <ul style="list-style-type: none"> Banks, Big Data and High-Performance Analytics Big Data and the Creative Destruction of Today's Business Models When is Big Data the way to Customer Centricity The Rise of Big Data Analytics for Marketing The Modern Data Warehouse— How Big Data Impacts Analytics Architecture 	Assignment 2
4	Feb 9	Hands-on Introduction to Big Data	Big Data 101 https://bigdatauniversity.com/courses/introduction-to-big-data/
5	Feb 16	Hands-on Introduction to Big Data	Big Data 101 https://bigdatauniversity.com/courses/introduction-to-big-data/ Assignment 3
6	Feb 23	Hadoop	Hadoop 101 https://bigdatauniversity.com/courses/introduction-to-hadoop/
7	Mar 2	Hadoop	Hadoop 101 https://bigdatauniversity.com/courses/introduction-to-hadoop/ Assignment 4
8	Mar 9	Not Only SQL and Database as a Service	NoSQL and DBaaS 101 https://bigdatauniversity.com/courses/introduction-nosql-dbaas/
9	Mar 16	Exam 1	
10	Mar 23	Not Only SQL and Database as a Service	NoSQL and DBaaS 101 https://bigdatauniversity.com/courses/introduction-nosql-dbaas/ Assignment 5
11	Mar 30	Introducing Teradata Studio and Teradata Aster <ul style="list-style-type: none"> Section I: The Big Picture and Setup 	Getting Started with Aster Express and AppCenter
12	Apr 6	Map-reduce with Teradata Aster <ul style="list-style-type: none"> Section II: SQL Map-Reduce Time Series with Teradata Aster <ul style="list-style-type: none"> Section III: Time Series functions 	Assignment 6 <ul style="list-style-type: none"> Bank web clicks analysis
13	Apr 13	Holiday: Spring Break	
14	Apr 20	Associative Analytics Functions with Teradata Aster	Assignment 7

		<ul style="list-style-type: none"> • Section IV: Associative Analysis functions Graph Analysis with Teradata Aster • Section V: Graph Analysis functions 	<ul style="list-style-type: none"> • Telco Churn Analysis
15	Apr 27	Predictive Analytics with Teradata Aster <ul style="list-style-type: none"> • Section VI: Predictive Analysis functions Clustering with Teradata Aster <ul style="list-style-type: none"> • Section VIII: Clustering functions 	Assignment 8 <ul style="list-style-type: none"> • Disease Network and its Properties • Network Analytics - A Healthcare Application
16	May 4	Project Presentations and Wrap up	Projects Due
17		Final Exam (Date and Time to be Announced)	