COURSE TITLE

INSTRUCTOR   Dr. Xun Zhou, Assistant Professor
xun-zhou@uiowa.edu, (319) 384-3335
S280 PBB, Iowa City, IA 52242

CLASS MEETING TIMES   Thursday 6:00PM-9:40PM
208 PEC John and Mary Pappajohn Education Center
1200 Grand Ave, Des Moines, IA 50309

OFFICE HOURS   Before/After Class; By Appointment

COURSE SITE   To access the course site, log into Iowa Courses Online (ICON) https://icon.uiowa.edu/index.shtml using your Hawk ID and password.

Program Goals –

The Tippie MSBA has learning goals that drive decisions about curriculum and assignments within courses:

Program Goal 1: Graduates will exhibit knowledge and skills relevant to data and its application in business

Program Goal 2: Graduates will create and communicate solutions to data-related business problems that impact their organizations and communities

Program Goal 3: Graduates will understand and contemplate ethical and privacy issues arising in their own work

Program Goal 4: Graduates will demonstrate the ability to be effective team members in a diverse and complex world.

Course Description and Goals

Recent years have witnessed the rapid development of numerous data-centric business models such as e-commerce, social networks, location-based services, and online recommendation systems. Huge amount of data with various formats and contexts are being generated at an unpreceded speed in global business. The success of modern firms

nowadays relies more and more heavily on the ability to collect, manage, and analyze these "Big Data". This course introduces concepts and techniques in big data management and analytics to address the variety and volume challenges of big data. Specifically, this course will introduce semi-structured data schema (e.g., XML) and how to obtain, process and analyze such data for business analytics. We will also discuss how to perform efficient analytical tasks on large datasets that cannot be easily handled by a traditional relational database.

1. Hadoop, Map-Reduce and HIVE

2. Big Data Analysis using Spark and SparkR

3. Semi-structured data: XML and JSON.

4. Other Topics

Media/System Requirements

Students need to bring their laptop computers to lectures for exercises and class activities. The laptop should have a main-stream browser and can access the Internet. Some software might be installed on the laptop. Tutorials on how to install them will be posted on ICON. Hadoop server accounts will be provided to students for Hadoop-related exercises and homework.

If you need assistive technologies that has different computer and technology requirements, then you will be responsible for making those arrangements. Please check with **Student Disability Services:** https://sds.studentlife.uiowa.edu to determine the requirements for specific technologies and for assistance if necessary.

Textbook/Materials

There is no required textbook. Optional readings are as follows:

1. Data Analytics with Hadoop: An Introduction for Data Scientist, 1st Edition. O'Reilly. Authors: Benjamin Bengfort, Jenny Kim. ISBN: 978-1491913703. O'R

2. Hadoop: The Definitive Guide: Storage and Analysis at Internet Scale 4th Edition. O'Reilly. Author: Tom White. ISBN: 978-1491901632

3. Apache Hive Guide https://cwiki.apache.org/confluence/display/Hive/Tutorial

4. Spark and SparkR guide: https://spark.apache.org/docs/latest/index.html

Grading Criteria

The final letter grade of a student is given based on the relative ranking of this student's final weighted score in the class rather than based on absolute thresholds. Detailed weights of each activity could be found in the table below. Final grades will be assigned according to the following recommended grading curve for full-time MBA elective courses: A range ≤ 60% of students, B range ≥ 40% of students, C, D, F range as needed for lack of mastery. Note the "A range" includes A+, A, A-, and the "B range" includes B+, B. However, the instructor may choose to modify the policy depending on the class average and variance (i.e., exceptionally good / poor performance). **Getting zero points in any assignment/project may result in an "F" in the final grade.**

Item	Total Weights
Big Data Showcase Presentation	10%
4 written homework	40% (10% each)
Course Project	35%
Final Big Data Hackathon	15%
Total	100%

Course Work

1. There will be **four (4) individual written/coding homework**. All the homework should be submitted online through the ICON system by 6PM on the due date (see schedule). Late submissions within 72 hours of deadline subject to 25% penalty per 24 hours. Late submissions beyond 72 hours will receive 0 points.

2. There is **one (1) Final Big Data Hackathon**. Students work individually to perform big data analytics tasks on given datasets during the last class. Grades will be given based on both results and code submitted.

3. **There is no written exam for this course.**

4. There is one **(1) group course project**. Students should form **groups of three.** The project has two phases, which are graded separately. Each group should submit a mid-term report, a final report, and deliver two presentations. Generally, every member in a group will receive the same grade for the project. However, grades might be adjusted if evidences show that some member(s) contributed significantly more/less than others in the same group. Detailed project description will be posted on ICON.

5. There **is one (1) Big Data Showcase Presentation**. Each project group should find an interesting big data related business case. Specifically, introduce the business

problem, the data, and the findings or outcomes from the analysis. The case could be from media, research papers, articles, or your own work or study experiences. Make slides and present the case at the beginning of the class. Each group should present once. Presentations start from 3rd week.

Course Calendar (subject to change)

Week	Date	Topic	HW available	HW due*	Project Due**
1	8/29	Introduction. Setting up and Review	HW0+		
2	9/5	Hadoop and HiveQL	HW1	HW0+	
3	9/12	Hadoop and HiveQL			
4	9/19	Spark and SparkR	HW2	HW1	
5	9/26	Spark and SparkR			
6	10/3	Midterm Project Presentation	HW3		Mid-term Report
7	10/10	Data Analysis using SparkR		HW2	
8	10/17	XML and JSON Data	HW4	HW3	
9	10/24	XML and JSON Data			
10	10/31	Final Project Presentation		HW4	
11	11/7	Final Big Data Hackathon			Final Report

+   HW0 is a background survey and is not graded.
*   All homework are due before class (Thursday 6PM) of the corresponding week.
** The project deliverables are due midnight of the due dates.

Course-Specific Policies and Guidelines

Communications: Students can expect to receive communications from the instructor (via course "Announcements" in ICON) during the semester. Students are also responsible for all official correspondence sent through their University of Iowa email address. Students can expect to receive responses to email inquiries within 24-48 hours.

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Privacy considerations, such as federal law, may apply when using an address other than the standard University e-mail address.

Attendance: Attendance in all class sessions is expected. However, unforeseen conflicts due occasionally arise. Students are expected to give adequate advance notice of an excused absence, make up the missed work and make every effort to avoid a class conflict. To ensure legitimacy, students may be asked to provide documentation upon request. Short-term illnesses will also be considered as excused absences, however students are asked to let me know prior to or even the day of the absence why they are not in class. A plan for managing longer term absences should be discussed with me to determine whether successful completion of the course is possible.

Late Work: Late submissions of any deliverable (HW, project reports, hackathon) within 72 hours of deadline subject to 25% penalty per 24 hours. Late submissions beyond 72 hours will receive 0 points.

Collaborations policy: The homework and hackathon are individual work. Discussion for the purpose of understanding a problem is not considered cheating. However, any solution and deliverable must be your own and original work. Copying others' work or materials on the Internet will be considered cheating.

All the group activities (project and big data show case) are collaborative work and should be completed by all the members of a group together. All members of a group will generally receive the same grade for these two activities. However, a peer-evaluation of contributions will be done at the end of the semester to assess the contributions of each individual. The final grade of the project/showcase will be adjusted based on the evaluation results.

Collegiate Policies and Guidelines

The administrative home of this course is the Tippie College of Business, which governs academic matters relating to the course such as the add/drop deadlines, the second-grade-only option, issues concerning academic misconduct, and how credits are applied for various graduation requirements. Different colleges might have different policies. As a registered student in a course in the Tippie College of Business, you are responsible for the collegiate policies posted below.

Please note that students of this program are subject to the policies, procedures, and requirements of the Graduate College and The University of Iowa as well. For additional details, students should consult: the Manual of Rules and Regulations of the Graduate College (http://www.grad.uiowa.edu/graduate-college-manual), applicable sections of The University of Iowa Catalog (http://www.registrar.uiowa.edu/registrar/catalog/) and

Policies and Regulations Affecting Students (http://dos.uiowa.edu/policy-list/current/).

Tippie Honor Code: The Tippie College of Business has an Honor Code, and you must abide by it in completion of all assignments. Integrity is a reflection of your character and is critical for creating meaningful and lasting relationships. One part of integrity is abstaining from acts like cheating, so cheating on any assignment in this class will result in an appropriate consequence, usually a zero for the grade in question and, if that penalty does not reduce the grade, a penalty of a full letter grade reduction. In addition, all incidents of cheating will be reported to the appropriate academic offices, and the student may be placed on disciplinary probation, be suspended, or even permanently expelled, depending on the severity of the offense.

If a student has been found in violation of this policy, they will first be notified directly, then I will report to the appropriate program office. Faculty and students can report Academic Misconduct via the college website.
(https://cm.maxient.com/reportingform.php?UnivofIowa&layout_id=6)

Privacy: As part of this course, your name will be revealed to other students in the class. If you have concerns, please contact the instructor immediately.

Lecture Capture Policy: As a service to students, the program offers Lecture Capture of most of its courses. This allows students to access video and audio recordings of the class, after the class has been recorded. As a student, you can opt out of being visible in the recording. Unless otherwise noted, this course is being recorded, and will be available to all enrolled members of the class under a password protected website (the ICON course site). The instructor may choose at various points (i.e. during exams or guest speakers) to not record the class. ** Note: It is the instructor's responsibility to expressly inform any guest speakers that their session is being recorded, and provide the ability for the speaker to opt-out of the recording.

Fairness and Freedom of Expression: Every student is entitled to the same intellectual freedom I have. I will respect that freedom, and I am obliged to protect your freedom to learn, regardless of your religion, race, sex, sexual orientation, gender identity, or political views, or on your agreement or disagreement with my positions pertaining to matters of controversy within the discipline. I will do my best to provide you with a fair and impartial evaluation of your work, consistent with articulated standards for this course.

Complaint Procedures: If at any time you have concerns about this class or your performance in it, please contact me directly. If you do not feel that your concern has been resolved satisfactorily, you should contact the Department Executive Officer (DEO) who oversees the department offering this course (Dr. Barret Thomas, barrett-thomas@uiowa.edu). If that does not resolve the complaint, you may contact the Associate Dean of Graduate Programs, David Frasier, david-frasier@uiowa.edu.

Inclement Weather/Class Cancellation: Although it is our intent to offer every class at its assigned time, on rare occasion there are weather or other emergency events that require that alternative arrangements are made for class delivery. If that happens, please stay alert for an email from me indicating how the class will be handled. This may include: 1) Cancelling the class completely – all reading and work that was due is expected to be completed and turned in on time through ICON; 2); Holding an online version of the class (i.e., via Zoom)– you will receive an email invitation to join the session remotely from a computer with an internet connection – headphones are recommended; 3) using recorded videos and presenting other materials to you through ICON so we can cover the course materials asynchronously.

University Policies and Guidelines

As a registered student in a course through The University of Iowa, the following University policies apply to you.

Accommodations for Disabilities: The University is committed to provide an educational experience that is accessible to all students. If you have a diagnosed disability or any other condition that would impair your ability to complete the course requirements as stated above, please inform me as early in the semester as possible, but no later than two weeks prior to the scheduled activity. Students needing accommodations must register with Student Disability Services, (SDS): https://sds.studentlife.uiowa.edu/students/apply to obtain a Letter of Accommodation (LOA). The letter will specify what course accommodations are reasonable for that student. The office is located at 3015 Burge Hall, (319) 335.1462.

Mental Health: Students are encouraged to be mindful of their mental health and seek help if they are feeling overwhelmed and/or incapable of meeting course expectations. For assistance with the class, students are encouraged to talk to the faculty member. For additional support and counseling, students are encouraged to contact The University Counseling Services in 1950 University Capital Centre or 3223 Westlawn South (319-335-7294). Call 319.335.7294 to schedule appointments (Mon-Fri. 8AM-4:30PM). Find out more about the UCS at http://counseling.uiowa.edu. After hours, we encourage you to call the Johnson County Crisis Line at 319.351.0140 or 911 if you are having a mental health emergency.

Sexual Harassment: Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. The University will not tolerate sexual harassment, nor will it tolerate unwelcomed behavior of a sexual nature toward members of the University community when that behavior creates an intimidating or hostile environment for employment, education, on-campus living, or participation in a University activity. As a member of the university community you have a responsibility to report concerns of sexual harassment immediately at the Office of the Sexual Misconduct Response Coordinator: https://osmrc.uiowa.edu/.

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Multicultural Holidays: Students compelled by their religious convictions to refrain from attending class on specific days must request instructor permission during the first few days of the session. If this request is denied, a student may address concerns according to University Procedures. https://dos.uiowa.edu/policies/student-complaints-concerning-faculty-action.

Sustainability: The University is committed to demonstrating sustainability practices within all facets of the institution. Student support is critical to our campus wide efforts to reduce waste by consuming as few natural resources as possible and purchasing recycled materials when feasible. Recycling and reuse of all materials is encouraged. Together, let's ensure a better world for us and future generations. Learn more at the Office of Sustainability: https://sustainability.uiowa.edu/.