

Texas A&M University Central Texas
CIS 5353.110
Big Data Analytics and Management
TAMUCT
FALL 2018

Instructor: Dr. Rahul Dwivedi

Office: Texas A&M University Central Texas FH 323N

Phone: 254 – 519 – 5724

TAMUCT Email: Rahul.dwivedi@tamuct.edu

Preferred Email: Course Canvas Site, Inbox tool.

Office Hours: Monday 10 am – 11 am (Room FH 323N)

Tuesday 10 am – 12 noon (Room FH 323N)

Wednesday 10 am – 11 am (Room FH 323N)

Thursday 2 pm – 4 pm (Room FH 323N)

Other times by appointment only

Mode of instruction and course access: This is an online course consisting of asynchronous instructional methods. The course uses the A&M-Central Texas Instructure Canvas learning management system(<https://tamuct.instructure.com/>). The course syllabus, schedule, supplemental readings, class announcements, power point slides, learning modules and other course related documents will be posted on canvas. Each student is responsible for the posted material and should check canvas at least once a weekly for updates. The course outline in this syllabus shows the basic schedule for the semester. New weekly assignment instructions will be posted EACH TUESDAY morning throughout the semester, and assignments, discussions and quizzes, will have an associated Sunday midnight deadline.

Student-instructor interaction: Please send all course related email correspondence through Canvas Inbox Tool. Please use TAMUCT email only when Canvas is not available. I check email several times a day during the week and at least once during the weekends. I will respond within 24 hours and within 48 hours on Saturday through Sunday. Please do not hesitate to stop by my office during the scheduled office hours or contact me via phone / Canvas Conversations Tool or *TAMUCT email*, if there are any personal problems or challenges that are hindering your regular progress in the course.

911 Cellular: Emergency Warning System for Texas A&M University – Central Texas 911Cellular is an emergency notification service that gives Texas A&M University-Central Texas the ability to communicate health and safety emergency information quickly via email, text message, and social media. All students are automatically enrolled in 911 Cellular through their myCT email account.

Connect at 911Cellular [<https://portal.publicsafetycloud.net/Texas-AM-Central/alert-management>] to change where you receive your alerts or to opt out. By staying enrolled in 911Cellular, university officials can quickly pass on safety-related information, regardless of your location.

COURSE INFORMATION

Course Overview and description:

The course covers fundamental concepts and principles of Big Data Analytics and its role in supporting/enhancing organizational-decision making and predictions. Topics covered include Big Data, trends, challenges and applications; Analytic methods, tools, technologies, infrastructure and strategies for Big Data Management; Data Privacy and Ethics.

Prerequisite: CIS 5311 or approval of department chair.

Course Objectives:

Successful completion of this course should enable the student to

- Describe Big Data and its role in the corporate world.
- Demonstrate an understanding of the current trends and critical challenges faced by organizations in dealing with Big Data
- Identify and use Big Data Applications
- Demonstrate an understanding of fundamental concepts and principles of Big Data Analytics and Management
- Apply a structured data analytics life cycle to big data analytics project
- Apply appropriate analytic methods to analyze data and to identify insights that enhance decision making and predictions in the organizations
- Describe Big Data Tools, Technologies, Infrastructure and Strategies
- Demonstrate an understanding of MapReduce paradigm and Hadoop ecosystem
- Discuss the critical privacy and ethical issues in Big Data Analytics
- Develop critical skills necessary for a data analyst or data scientist.

Student Learning Outcome:

Student learning outcomes are in the Canvas classroom at the beginning of each module.

Required Reading and Textbook(s):

- Big Data Fundamentals: Concepts, Drivers & Techniques, Erl, Khattak & Buhler, Prentice Hall, ISBN: 9780134291208
- Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, EMC Education Services, Wiley, ISBN: 978-1-118-87613
- Additional readings will be made available in Canvas
- Case Studies may need to be purchased.

Optional (Reference) Textbook:

- Hadoop: The Definitive Guide: Storage and Analysis at the Internet Scale, White, O'Reilly, ISBN: 9781491901632

Note: A student of this institution is not under any obligation to purchase a textbook from a university-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

- **Supplementary Material:** The course textbook will be supplemented with other materials including handouts, oral presentations, industry articles, videos, research paper readings, tutorials, case studies, projects etc.
- **On-Line References TBA**
- Students preferring to use their own computers are required to have products, data encodings, file names, system structure, and products equal to those provided in the computer lab and the server used in class.
- Current publications - The campus library contains numerous books and periodicals relating to Computer Science. The student should take advantage of this resource by visiting the library.

COURSE REQUIREMENTS

Reading Assignments: All assigned readings & chapters will be used as basis for class /canvas discussions. Students are expected to study the assigned readings before each class session.

Class Participation / Canvas Discussions: Students are required to participate in the discussions in class and on Canvas throughout the semester. The maximum total for discussion assignments is 50 points. Students are expected to post thoughtful and comprehensive responses to the discussion questions as well as respond on a timely basis to a minimum of two classmates' postings. Failure to do so will result in point loss. Post your initial response to the discussion topic prior to 11.59 pm Wednesday and respond to other student's postings later in the week. Please do not be late in your postings as other students will be waiting on your post to respond to later in the week. Discussion topics, due dates and the grading rubric specific to discussion evaluations are available in canvas and should be used as a guide when participating in discussions. It is each student's responsibility to accumulate notes from assigned readings, supporting videos, and other sources and reference them in the postings to support one's own arguments, add an insight to classmate's postings and/or challenge classmates' postings. Sources when referenced must be cited in the postings. Follow-up posts need to be meaningful and should promote in depth discussions on a topic at higher level of thinking. A mere cursory response such as "I agree" or "I disagree" or a "good post" without any substantive content to backup would result in point loss. In all postings, students are expected to observe proper rules of netiquette in both oral and written communications and conduct in a professional manner. Late submissions are not allowed for discussion forums.

Examinations - There will be two exams, one midterm and one final exam. Each will be worth 200 points. Exams will have a short window of availability via Canvas, must be completed in one session, and will be timed. Makeup exams will be given ONLY when arrangements have been made PRIOR to the class meeting.

Homework Assignments - There will be a series of assignments assigned during the semester. The maximum total for all assignments is 200 points. All assignments are submitted through the

canvas course web site. All assignment submissions require a zipped copy of your assignment that allows me to unzip, open, and view the contents or other documents associated with the assignment. Please include your name and assignment identification in the zip file name (YourName_ChX.zip). You should also note that archives such as .rar, .gz, .tar, .7z, (among others) are not zip archives. Assignment submissions failing to provide the specified naming, identification, and format will not be accepted for grading. All assignments are due on the specified due date and time. Assignments turned in after due dates are considered late. 5 points will be deducted for each day the assignment is late. Special circumstances need to be discussed with the instructor ahead of time when possible.

Semester Long Project: There will be one Team Project where student groups will work as a team to apply the concepts, analytic methods, tools and techniques covered in the class to a big data analytics project. Please see separate write – up in the canvas for the project details. For the team project, students can self-select into teams of 2 to 3 members using the Canvas team tool. Students must choose their teammates before the end of the third week. Projects turned in after due date are considered *late*. 5 points will be deducted for each day the project is late. Special circumstances need to be discussed with the instructor ahead of time when possible.

Team Projects: Each team will select a leader, and the team will have meetings outside class time either online or face to face. I expect each team member to fully participate on team projects. All team members will receive the same grade for the team projects. However, I reserve the right to make exceptions to that practice as circumstances such as performance imbalance or communication issues warrant. Poor individual contributions to the team project as noted by your team members will result in a poorer individual grade on the team project.

Research Paper: Each student is required to write a major survey paper examining large number of works on a topic within the domain of Big Data. Topics must be approved by the instructor before the second meeting of the class. This paper must be 10 to 12 pages in length (type written and double-spaced, 12-point font with 1-inch margins) excluding bibliography, table of contents, graphics, tabular or illustrative material. References should include current sources and must conform to APA or Chicago style. The paper is expected to meet graduate-level standards and be suitable for publication in a professional journal. References must be from peer reviewed journals / conferences only. Use of Wikipedia or the class text as a reference will cause a serious loss of points. References must include the published journal / conference name and information, NOT a URL where paper was found. A grading rubric for research paper is available in canvas and should be used as a guide when completing the paper. Late submissions are not allowed for research paper.

Grading Criteria Rubric and Conversion

Assignment	Points	Percent
Exam 1	200 points	20%
Exam 2	200 points	20%
Homework Assignments	200 points	20%
Research Paper	150 points	15%
Team Project	200 points	20%
Class Participation/ Canvas Discussions	50 points	5%

Percent	Points	Letter Grade
89.5% to 100%	895 – 1000 points	A
79.7% to 89.4%	795 – 894 points	B
69.5% to 79.4%	695 – 794 points	C
59.5% to 69.4%	595 – 694 points	D
0 – 59.4%	0 – 594 points	F

Posting of Grades:

All student grades will be posted on the Canvas Grade book and students should monitor their grading status through this tool. Grades for weekly assignments, discussions, quizzes and exams will be posted within 7 days following the due date.

COURSE OUTLINE AND CALENDAR

Complete Course Outline

The instructor reserves the right to make changes to this syllabus. Any changes that effect grades or grading will be made in writing.

Week	Date	Content	Readings	Assignments
1	08/28/2018	Course Welcome, Introduction, and overview of course objectives, and expectations. Understanding Big Data.	Purchase and receive text. Read Syllabus in-depth. Chapter 1 from Big Data Fundamentals Book.	Post to Introductory Meet & Greet Discussion forum
2	09/04/2018	Introduction to Big Data Analytics	Chapter 1 from Data Science and Big Data Analytics Book	Assignment 1 available via Canvas
3	09/11/2018	Business Motivations and Drivers for Big Data Adaption.	Chapter 2 from Big Data Fundamentals Book.	Individual Research Paper Topic Due.
4	09/18/2018	Data Analytics Life Cycle.	Chapter 2 from Data Science and Big Data Analytics Book.	Assignment 1 Due.
5	09/25/2018	Big Data Adoption and Planning Considerations.	Chapter 3 from Big Data Fundamentals Book.	1 Page Single Spaced Problem Statement for Term Project Due.
6	10/02/2018	Review of Basic Data Analytic Methods using R.	Chapter 3 from Data Science and Big Data Analytics Book.	Assignment 2 available via Canvas
7	10/09/2018	Advanced analytical methods: Clustering and Association Rules.	Chapter 4,5 from Data Science and Big Data Analytics Book.	
8	10/16/2018	Advanced analytical	Chapter 6,7 from Data Science	Assignment 4 available via

		methods: Regression and Classification.	and Big Data Analytics Book.	Canvas. Assignment 3 Due.
9	10/23/2018	Mid Term Exam	Chapter 1,2 from Big Data Fundamentals Book and Chapter 1,2,3,4,5,6,7 from Data Science and Big Data Analytics Book.	Assignment 2 Due.
10	10/30/2018	Advanced analytical methods: Time Series Analyses.	Chapter 8 from Data Science and Big Data Analytics Book.	
11	11/06/2018	Advanced analytical methods: Text Analyses.	Chapter 9 from Data Science and Big Data Analytics Book.	
12	11/13/2018	Enterprise Technologies and Big Data Business intelligence.	Chapter 4 from Big Data Fundamentals Book.	
13	11/20/2018	Big Data Storage and Processing Concepts.	Chapter 5,6 from Big Data Fundamentals Book.	
14	11/27/2018	Big Data Storage technology.	Chapter 7 from Big Data Fundamentals Book.	Assignment 3 available via Canvas
15	12/04/2018	Advanced analytical methods: Map Reduce and Hadoop.	Chapter 10 from Data Science and Big Data Analytics Book.	Assignment 4 Due.
16	12/11/2018	Final Exam.		Individual Research Paper Due. Team Term Project Due.

Important University Dates:

August 27, Add/Drop/Late Registration begins
August 29, Add/Drop/Late Registration ends, 16-week and 1st 8-week classes
September 3, Labor Day, CAMPUS CLOSED
September 4, Last day to drop 1st 8-week classes with no record
September 12, Last day to drop 16-week classes with no record
October 5, Last day to drop a 1st 8-week class with a Q or withdraw with a W
October 5, Deadline to submit graduation
October 19, Last day to withdraw from the University (1st 8-week classes WF)
October 22, Add/Drop/Late Registration begins, 2nd 8-week classes
October 24, Add/Drop/Late Registration ends, 2nd 8-week classes
October 29, Last day to drop 2nd 8-week classes with no record
November 9, Last day to drop with a Q or withdraw with a W (16-week classes)
November 12, Veteran's Day (no class)
November 22-23, Thanksgiving, CAMPUS CLOSED
November 30, Last day to drop a 2nd 8-week class with a Q or withdraw with a W
December 14, Last day to withdraw from the University (16-week and 2nd 8-week classes)
December 14, Last day to file for Degree Conferral (Registrar's Office)
December 14, Commencement (End of Fall Term)
December 24-January 1, WINTER BREAK

TECHNOLOGY REQUIREMENTS AND SUPPORT**Technology Requirements.**

This course is a blended / hybrid course and will use the A&M-Central Texas Instructure Canvas learning management system.

Logon to A&M-Central Texas Canvas [<https://tamuct.instructure.com>].

Username: Your MyCT username (xx123 or everything before the "@" in your MyCT e-mail address)

Password: Your MyCT password

Technology Support.

For log-in problems, students should contact Help Desk Central.

24 hours a day, 7 days a week:

Email: helpdesk@tamu.edu

Phone: (254) 519-5466

Web Chat: [<http://hdc.tamu.edu>]

Please let the support technician know you are an A&M-Central Texas student.

For issues with **Canvas**, select "chat with Canvas support," submit a support request to Canvas Tier 1, or call the Canvas support line: 1-844-757-0953, links to all are found inside of Canvas using the "Help" link.

For issues related to course content and requirements, contact your instructor.

UNIVERSITY RESOURCES, PROCEDURES, AND GUIDELINES

Drop Policy:

If you discover that you need to drop this class, you must complete a [Drop Request Form](https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf) [https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf].

Professors cannot drop students; this is always the responsibility of the student. The Registrar's Office will provide a deadline on the Academic Calendar for which the form must be completed, signed and returned. Once you return the signed form to the Registrar's Office, you must go into Warrior Web and confirm that you are no longer enrolled. If you still show as enrolled, FOLLOW-UP with the Registrar's Office immediately. You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the drop deadline or fail to follow the procedure, you will receive an F in the course, which may affect your financial aid and/or VA educational benefits.

Academic Integrity:

Texas A&M University -Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student's academic performance and includes, but is not limited to, cheating on an examination or other academic work, plagiarism and improper citation of sources, using another student's work, collusion, and the abuse of resource materials. All academic misconduct concerns will be reported to the university's Office of Student Conduct. Ignorance of the university's standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

Academic Accommodations:

At Texas A&M University-Central Texas, we value an inclusive learning environment where every student has an equal chance to succeed and has the right to a barrier-free education. The Office of Access and Inclusion is responsible for ensuring that students with a disability receive equal access to the university's programs, services and activities. If you believe you have a disability requiring reasonable accommodations please contact the Office of Access and Inclusion at (254) 501-5831. Any information you provide is private and confidential and will be treated as such.

For more information please visit our [Access & Inclusion](https://www.tamuct.edu/student-affairs/access-inclusion.html) web page [https://www.tamuct.edu/student-affairs/access-inclusion.html].

Important information for Pregnant and/or Parenting Students:

Texas A&M University-Central Texas supports students who are pregnant and/or parenting. In accordance with requirements of Title IX and related guidance from US Department of Education's Office of Civil Rights, the Dean of Student Affairs' Office can assist students who are pregnant and/or parenting in seeking accommodations related to pregnancy and/or parenting. Students should seek out assistance as early in the pregnancy as possible. For more information, please visit the [Student Affairs](https://www.tamuct.edu/student-affairs/index.html) web page [https://www.tamuct.edu/student-affairs/index.html]. Students may also contact the institution's Title IX Coordinator. If you would like to read more about these [requirements and guidelines online](http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf), please visit the website [http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf].

Title IX of the Education Amendments Act of 1972 prohibits discrimination on the basis of sex and gender—including pregnancy, parenting, and all related conditions. A&M-Central Texas is able to provide flexible and individualized reasonable accommodation to pregnant and parenting students. All pregnant and parenting students should contact the Associate Dean in the Division of Student Affairs at (254) 501-5909 to seek out assistance. Students may also contact the University's Title IX Coordinator.

Tutoring:

Tutoring is available to all A&M-Central Texas students, both on-campus and online. Subjects tutored on campus include Accounting, Advanced Math, Biology, Finance, Statistics, Mathematics, and Study Skills. Tutors are available at the Tutoring Center in Warrior Hall, Suite 111.

If you have a question regarding tutor schedules, need to schedule a tutoring session, are interested in becoming a tutor, or have any other question, contact Academic Support Programs at (254) 519-5796, or by emailing Dr. DeEadra Albert-Green at deeadra.albertgreen@tamuct.edu.

Chat live with a tutor 24/7 for almost any subject from on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log in and receive FREE online tutoring and writing support. This tool provides tutoring in over 40 subject areas. Access Tutor.com through Canvas.

University Writing Center:

Located in Warrior Hall 416, the University Writing Center (UWC) at Texas A&M University–Central Texas (TAMUCT) is a free workspace open to all TAMUCT students from 10:00 a.m.-5:00 p.m. Monday thru Thursday with satellite hours in the University Library Monday thru Thursday from 6:00-9:00 p.m. This semester, the UWC is also offering online only hours from 12:00-3:00 p.m. on Saturdays.

Students may arrange a one-on-one session with a trained and experienced writing tutor by visiting the UWC during normal operating hours (both half-hour and hour sessions are available) or by making an appointment via [WConline](https://tamuct.mywconline.com/) at [https://tamuct.mywconline.com/]. In addition, you can

email Dr. Bruce Bowles Jr. at bruce.bowles@tamuct.edu for any assistance needed with scheduling.

Tutors are prepared to help writers of all levels and abilities at any stage of the writing process. While tutors will not write, edit, or grade papers, they will assist students in developing more effective composing practices. By providing a practice audience for students' ideas and writing, our tutors highlight the ways in which they read and interpret students' texts, offering guidance and support throughout the various stages of the writing process. In addition, students may work independently in the UWC by checking out a laptop that runs the Microsoft Office suite and connects to WIFI, or by consulting our resources on writing, including all of the relevant style guides. Whether you need help brainstorming ideas, organizing an essay, proofreading, understanding proper citation practices, or just want a quiet place to work, the UWC is here to help!

If you have any questions about the UWC, please do not hesitate to contact Dr. Bruce Bowles Jr. at bruce.bowles@tamuct.edu.

University Library:

The University Library provides many services in support of research across campus and at a distance. We offer over 200 electronic databases containing approximately 250,000 eBooks and 82,000 journals, in addition to the 85,000 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at A&M-Central Texas are available through our website to help students navigate these resources. On campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.

Research assistance from a librarian is also available 24 hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance, and may take place on Skype or in-person at the library. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together research for written assignments.

Our 27,000-square-foot facility on the A&M-Central Texas main campus includes student lounges, private study rooms, group work spaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our [Library website](http://tamuct.libguides.com/index) [http://tamuct.libguides.com/index].

OPTIONAL POLICY STATEMENTS:

A Note about Sexual Violence at A&M-Central Texas

Sexual violence is a serious safety, social justice, and public health issue. The university offers support for anyone struggling with these issues. University faculty are mandated reporters, so if someone discloses that they were sexually assaulted (or a victim of Domestic/Dating Violence or Stalking) while a student at TAMUCT, faculty members are required to inform the Title IX Office. If you want to discuss any of these issues confidentially, you can do so through Student Counseling (254-501-5955) located on the second floor of Warrior Hall (207L).

Sexual violence can occur on our campus because predators often feel emboldened, and victims often feel silenced or shamed. It is incumbent on ALL of us to find ways to actively create environments that tell predators we don't agree with their behaviors and tell survivors we will support them. Your actions matter. Don't be a bystander; be an agent of change. For additional information on campus policy and resources visit the [Title IX webpage](https://www.tamuct.edu/departments/compliance/titleix.php) [https://www.tamuct.edu/departments/compliance/titleix.php].

Copyright Notice:

Students should assume that all course material is copyrighted by the respective author(s). Reproduction of course material is prohibited without consent by the author and/or course instructor. Violation of copyright is against the law and Texas A&M University-Central Texas' Code of Academic Honesty. All alleged violations will be reported to the Office of Student Conduct.

INSTRUCTOR POLICIES

The instructor reserves the right to make changes to this syllabus during the semester for the benefit of the students. Any changes that effect grades or grading will be made in writing. Instructor reserves the right to supplement the material presented in the text with additional material including handouts, oral presentations, industry articles, videos, research paper readings, case studies, power point presentations etc. for the benefit of the students.

All work is submitted through Canvas and due on the specified due date/time. Work turned in after due date is considered *late*. 5 points will be deducted for each day the assignment is late. Special circumstances need to be discussed with me ahead of time when possible. Missed assignments, projects, and examinations will receive a grade of zero.

Any work not submitted in the proper format is rejected and receives no credit. Incidents of violations of academic integrity, such as plagiarism or turning in the work of others as your own work, will result in a cap on the maximum number of points that can be earned in this class. The cap will be 600 points resulting in a best-case grade of "D" for the class.

At all times in the class, please observe proper rules of netiquette in your oral and written communication and conduct yourself in a professional manner.