NORTHWEST
MISSOURI STATE UNIVERSITY
MARYVILLE | KANSAS CITY

School of Computer Science and Information Systems

44–517:Big Data(3 hrs.)
Fall 2022

Instructor:	Dr. Ajay Bandi		**Email:**	ajay@nwmissouri.edu
Office hrs:	CH2250		**Office:**	W 3:00–5:00,TR 1:00–3:30kl
Phone:	660.562.1199		**Sections:**	01,03
Instructor:	Dr. Nathan Eloe		**Email:**	nathane@nwmissouri.edu
Office hrs:	CH2270		**Office:**	TR 11:00–1:00, 2:00–3:30
Phone:	660.562.0832		**Sections:**	02,04

Prerequisites: Undergraduate: 44–242 with a grade of C or better. Graduate: 44–542 with a grade of B or better, or concurrent enrollment in 44–542, or consent of instructor.

Textbook and Supplementary Materials: Resources will be provided by the instructor as necessary through the semester.

Course Description: An introduction to the design of data-intensive, reliable, scalable, and maintainable systems. Includes an introduction to current and relevant tools, technologies, design principles, and frameworks. This may include concepts such as parallel programming, distributed computing, distributed file systems, MapReduce, regular expressions, and the ingesting and processing of data at rest and data in motion. Tools used may include Hadoop, HDFS, Pig, Hive, Spark, Storm, Kafka, Mahout, MLlib, etc.

Student Learning Outcomes: *This course satisfies the following outcomes for the School of CSIS:*

Outcome	Assessment Methods
DSI students will access, generate, and reorganize information using contemporary technologies.	Selected assignment(s)
DSI Students will work as a team to design, implement, and deliver solution s to problems using best practices with contemporary technologies.	Selected assignment(s)

In addition, after completing this course, a student should be able to:

- Describe the characteristics of big data systems
- Describe the history of distributed data processing including Hadoop, HDFS, and MapReduce
- Describe big data integration platforms (e.g. Apache Beam)
- Compare choices for data processing engines
- Describe key processing concepts
- Describe common options for programming languages
- Describe common options for I/O connectors
- Create and execute big data jobs using contemporary technologies
- Function effectively on teams to accomplish a common goal

Instructional Methods: Class time will consist primarily of lecture and student discussion about course topics, with time allotted for individual or group work on projects, homework, and hands on activites.

Graded Course Requirements: Tentatively, the grade will be weighted as follows:

Category	Weight
Exam 1	14%
Exam 2	14 %
Discussions	20%
Assignments and In Class Activities	23%
Final Project	29%

Grading Scale: The grading scale is the standard 10 point grading scale, but may be revised in the students' favor at the instructor's discretion.

Undergraduate:

>90%	A
80%-89.9%	B
70%-79.9%	C
60%-69.9%	D
<60%	F

Graduate:

>90%	A
80%-89.9%	B
70%-79.9%	C
<70%	F

Late Policy: Late work will not be accepted. The instructor may give extensions in extenuating circumstances; extensions should be discussed with the instructor before the deadline.

Course Outline/Major Topics Studied:
- Introduction to Big Data
- Structured, Semi-structured, and Unstructured Data
- Hadoop
- Distributed Database Architectures
- Data Engineering
- Python for Data Science
- Map Reduce
- Selected Java topics
- PySpark
- Apache Beam
- Apache Kafka

Attendance: Attendance during scheduled course times is important for continued success in this course. Students will be responsible for material covered and work assigned during class lectures and hands on learning time.

Students should consider their wellbeing and the safety of themselves and others when determining when to be physically present at a course meeting, and follow guidelines provided by local health officials and the University. It is the student's responsibility to prompltly notify their instructor when unable to attend class. Please refer to the university policy on attendance at https://www.nwmissouri.edu/policies/academics/Attendance.pdf

Final Exams: If an emergency occurs that prevents the administration of a course scheduled final examination, the final course grades will be calculated based on the work in the course completed to that point in time and the faculty member's considered judgment. Final exams will not be rescheduled, and a grade of "I" will not be given as a result of an institutional cancellation of a final examination. This final exam policy does not apply to online courses.

Disclaimer: Course schedule is subject to change and you will be responsible for abiding by any such changes. Your instructor will notify you of any changes.

Administrative Drop: An instructor may request the Office of the Registrar delete a student from a course roster if the student has not met the prerequisite for the course as stated in the catalog, or as a result of non-attendance in the course.

Academic Administrativve Withdrawal: When it is in the best interest of Northwest Missouri State University for a student to withdraw, a student will be given a W, put on administrative hold, and given notice that they are about to be withdrawn. This action will result in removal of all credits associated with courses that have yet to be completed in the semester in question and the student will be administratively withdrawn from the University. An Administrative Withdrawal does not affect the student's grade point average. Please refer to Northwest Missouri State University's Academic Administrative Withdrawal Policy at: https://www.nwmissouri.edu/policies/academics/Adding-Dropping-Withdrawals.pdf

University Communications: Students are expected to use their Northwest student email account for any electronic correspondence within the university. Students are also strongly advised to check their email and CatPAWS accounts on a regular basis. Announcements will be made through Northwest Online (Canvas).

Academic Integrity Policy: The students, faculty, and staff at Northwest endeavor to sustain an environment that values honesty in academic work, that acknowledges the authorized aid provided by and intellectual contributions of others, and that enables equitable student evaluation. Please refer to Northwest Missouri State University's Academic Integrity Policy at http://www.nwmissouri.edu/policies/academics/Academic-Integrity.pdf

Learning or Living Accomodations Request Process: Northwest Missouri State University complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 [ADA] and the ADA Amendments Act of 2008 [ADAAA]. If a student has a documented disability that qualifies under the ADA/ADAAA and requests accommodations, they should review the Accessibility and Accommodations webpage at https://www.nwmissouri.edu/titleixequity/accessibility/index.htm for guidance, including the accommodations application and supporting documentation requirements. Contact ada@nwmissouri.edu or 660.562.1873 for further assistance. For the university policy on disability accommodation refer to http://www.nwmissouri.edu/policies/student/Disability-Accommodation.pdf.

Non-discrimination and Anti-harassment Policy: Northwest Missouri State University is committed to maintaining an environment for all faculty, staff, students, and third parties that is free of illegal discrimination and harassment. Please refer to the Non-Discrimination and Anti-Harassment Policy at https://www.nwmissouri.edu/TitleIXEquity/titlevi/.

Family Education Rights and Privacy Act (FERPA) Policy: Family Educational Rights and Privacy Act of 1974, as amended (commonly known as the Buckley Amendment), is a federal law which provides that colleges and universities will maintain the confidentiality of student education records. Please refer to the Family Educational Rights and Privacy Act (FERPA) Policy at
http://www.nwmissouri.edu/policies/academics/Family-Educational-Rights-and-Privacy-Act.pdf

Behavior and Wellness: Northwest focuses on student success—every student, every day. The Wellness Center, 660.562.1348, offers free counseling for students coping with depression, anxiety, alcohol or drug misuse, relationships, and other emotional, social, and academic stressors. In addition, faculty, staff, and students who are concerned with student wellbeing can report their concerns, including anonymously, to the Behavioral Intervention Team, so that the student can be offered relevant support, here: Concerning Behavior Reporting Form. If you are concerned about the immediate safety of a student, please call the University Police, who have specialized training in intervention, at 660.562.1254.

Disclaimer: Course schedule is subject to change and you will be responsible for abiding by any such changes. Your instructor will notify you of any changes.