

# *Syllabus subject to change*

## CS 598: Cloud Computing Capstone

### Course Description

This course will allow you to apply the algorithms and techniques for cloud computing that you learned in Cloud Computing Concepts and Cloud Computing Applications to solve an interesting **real-world cloud computing challenge**.

Note: You should complete Cloud Computing Concepts and Cloud Computing Applications before beginning this course.

In the real world, large datasets are processed in either a batch mode or a streaming mode, and in many cases both at the same time to complement each other. The Capstone course captures this, but limits the work to only one target challenge. This allows you to compare and contrast your experiences from using different systems easily, and also verify your own results (from the second system onward).

Specifically, you will work on querying an airline transportation dataset to answer different types of queries. You will be repeating the same project in batch processing modes (using Hadoop/Cassandra) and stream processing mode (using Spark Streaming).

This course is composed of two components (assessment).

The first component of the course, paper presentation, will have you presenting one paper picked for you by the instructor. You will present the paper (in video format) to the rest of your class for peer-review and feedback.

The second component of the course, capstone project, will ask you to query airline transportation dataset to solve real-world challenges.

### Course Prerequisite

- Cloud Computing Concepts
- Cloud Computing Applications

This course can be quite challenging. This course assumes that you have taken **all the courses above** and **completed all the programming assignments in those courses!** If any of these conditions are not true for you, this capstone may not be for you (and you will likely struggle), although finishing the capstone might be a good opportunity to put everything together.

### Course Expectation

This course is designed to be studied on your own. No further lecture content will be provided.

## Course Goals

By the end of the course, you will be able to:

- Integrate different systems with each other, e.g. Hadoop with HDFS and Cassandra.
- Solve real-world Big Data challenges using cutting-edge cloud computing systems including Apache Hadoop, and Spark.
- Solve real-world Big Data challenges using both batch processing systems and stream processing systems.

## Textbook

There are no required textbooks for this course. Please review your materials from the prerequisite courses during the capstone course.

## Course Schedule

<b>Week</b>	<b>Duration (MM/DD – MM/DD)</b>	<b>Topic</b>	<b>Relevant Concepts and Techniques</b>
1	1/15 – 1/21	Capstone Project, Task 1	Data Cleaning; HDFS Hadoop; Cassandra
2	1/22 – 1/28	Capstone Project, Task 1	Data Cleaning; HDFS Hadoop; Cassandra
3	1/29 – 2/4	Capstone Project, Task 1	Data Cleaning; HDFS Hadoop; Cassandra
4	2/5 – 2/11	Capstone Project, Task 1	Data Cleaning; HDFS Hadoop; Cassandra
5	2/12 – 2/18	Paper Presentation & Capstone Project, Task 1	
6	2/19 – 2/25	Paper Presentation & Capstone Project, Task 1	
7	2/26 – 3/4	Paper Presentation & Capstone Project, Task 1	
8	3/5 – 3/11	Capstone Project, Task 2	Spark
9	3/12 – 3/18	Capstone Project, Task 2	Spark
10	3/19 – 3/25	Spring Break	
11	3/26 – 4/1	Capstone Project, Task 2	Spark
12	4/2 – 4/8	Capstone Project, Task 2	Spark

## Elements of This Course

The course is comprised of the following elements:

- Lecture Video. A short video gives an overview of the Capstone project and tasks. **No** further lecture videos will be provided in this course, as this is a self-learning course.
- Paper Presentation. 10 papers will be given to choose from. You will choose 1 paper and prepare a 20 minute presentation on the paper you have chosen. You should peer review a different paper than the one you presented.
- Capstone Project. A comprehensive project with multiple tasks is offered. You will need to finish these tasks and create a video and written report. All videos and reports will be peer graded. You are expected to peer review at least 3 other projects. It is recommended that you review 5 of your peers' projects.

## Assignment Deadlines

For all assignment deadlines, please refer to the Course Deadlines, Late Policy, and Academic Calendar page.

## Grading Distribution and Scale

### Grading Distribution

Your final grade will be calculated based on the activities listed in the table below. Your official final course grade will be listed in [Enterprise](#). The course grade you see displayed in Coursera may not match your official final course grade.

Assignment	Percentage
Paper Presentation	34%
Capstone Project	33% (Task 1) + 33% (Task 2) = 66%
Total	100%

## Student Code and Policies

A student at the University of Illinois at the Urbana-Champaign campus is a member of a University community of which all members have at least the rights and responsibilities common to all citizens, free from institutional censorship; affiliation with the University as a student does not diminish the rights or responsibilities held by a student or any other community member as a citizen of larger communities of the state, the nation, and the world. See the [University of Illinois Student Code](#) for more information.

## Academic Integrity

All students are expected to abide by [the campus regulations on academic integrity found in the Student Code of Conduct](#). These standards will be enforced and infractions of these rules will not be tolerated in this course. Sharing, copying, or providing any part of a homework solution or code is an infraction of the University's rules on academic integrity. We will be actively looking for violations of this policy in homework and project submissions. Any violation will be punished as severely as possible with sanctions and penalties typically ranging from a failing grade on this assignment up to a failing grade in the course, including a letter of the offending infraction kept in the student's permanent university record.

Again, a good rule of thumb: *Keep every typed word and piece of code your own*. If you think you are operating in a gray area, you probably are. If you would like clarification on specifics, please contact the course staff.

## Disability Accommodations

Students with learning, physical, or other disabilities requiring assistance should contact the instructor as soon as possible. If you're unsure if this applies to you or think it may, please contact the instructor and [Disability Resources and Educational Services \(DRES\)](#) as soon as possible. You can contact DRES at 1207 S. Oak Street, Champaign, via phone at (217) 333-1970, or via email at [disability@illinois.edu](mailto:disability@illinois.edu).