

# Course Syllabus- 202280-DSBA-6190

## Faculty – Sabyasachi Gupta

Introduction to the basic principles of cloud computing for data intensive applications. Covers a broad range of technologies and solutions from data platform architecture to data analytics. Focuses on the scalable deployment of cloud resources and the integration between individual services. Topics covered will include data architecture such as SQL databases and data lakes, parallel computing using cluster technologies such as Apache Spark, machine learning using common classification, clustering, and regression algorithms, and deep learning using GPU-based infrastructure.

### Learning Outcomes

1. Understand the benefits & terminologies of cloud-based architecture
2. Architect end-to-end solutions based on user/organizational requirements
3. Recognize the differences in data & storage platform options on-premise versus in the cloud
4. Recognize the differences in compute platform options on-premise versus in the cloud
5. Discuss the cloud and on-premise machine learning approaches and the benefits therein
6. Think holistic cloud solutions for real-world business use cases, starting from inception to design to operational maintenance.
7. Understand product comparisons between 3 big cloud vendors of AWS, Azure and GCP.

### Grades

There are 1,000 points in this course, divided:

- 400 points for Assignments, Labs, & Quizzes
- 300 points for Final Presentation
- 200 points for Exams (mid-term & final)
- 100 points for in-class & online forum participation

Based on your points at the end of the class, your final grade will be:

>= 900	A
800-899	B
700-799	C
> 700	D or Inc.
Academic Dishonesty	F

## General Schedule

Date	Section	Topics
25 Aug	<b>Introduction</b>	Definitions, Use Cases, Value Propositions
1 Sep	<b>Data Platform</b>	Everything data services on cloud (PaaS/SaaS)
8 Sep	<b>Compute Platform</b>	Everything infrastructure services on cloud (IaaS)
15 Sep	<b>Security &amp; IAM (Identity and Access Management)</b>	Users, Groups, Roles, Permissions, Service Accounts, and Security
Sep 22	<b>Machine Learning</b>	Machine Learning Introduction
Sep 29	<b>Machine Learning</b>	<ul style="list-style-type: none"> <li>• Cloud offerings, SageMaker, AutoML</li> <li>• ML-Ops</li> </ul>
Oct 6	<b>Mid-Term Review and Cloud Open Day-1</b>	Prep for the final exam, project and discuss applications of cloud in real-world.
Oct 13	<b>Mid-Term Exam</b>	<b>VIRTUAL CLASS</b>
Oct 20	<b>Cloud Sizing, Deployment, &amp; Automation</b>	<ul style="list-style-type: none"> <li>• Pricing models &amp; estimation</li> <li>• Deployment planning</li> <li>• Automation / Cloud Ops</li> </ul>
Oct 27	<b>Data Engineering using Cloud Data Analytics Services (Streaming, Batch etc.)</b>	<ul style="list-style-type: none"> <li>• Data Ops</li> <li>• Data Analytics via cloud services like Glue, EMR, Snowflake etc.</li> </ul>
Nov 3	<b>Deep Learning</b>	Intro to Deep Learning, Neural Networks, GPU/TPU model training, Transfer Learning, and Cloud offerings
Nov 10	<b>Class Project Day (Individual)</b>	<b>VIRTUAL CLASS</b>
Nov 17	<b>Review for Final Exam, Project &amp; Cloud Open Day-2</b>	Prep for the final exam, project and discuss applications of cloud in real-world.
Nov 24	<b>NO CLASS</b>	
Dec 1	<b>Final Project Presentations (Group)</b>	
Dec 8	<b>Final Exam</b>	<b>VIRTUAL CLASS</b>

## Course Communication

Students are responsible for *\*all\** announcements made in class and on the class online resources. Students should check the online class resources throughout the semester. The Instructor and Teaching Assistants send occasional e-mails with important information. We send this information to the student's UNC Charlotte e-mail address listed on Banner system. If a student is not checking his / her UNC Charlotte e-mail address (ex. [userName@uncc.edu](mailto:userName@uncc.edu) ) please be sure to access this e-mail and check it regularly during this course.

If you have any questions about the course content or assignments please email me and our class TA, Syed Muhammad Suffwan @ [ssuffwan@uncc.edu](mailto:ssuffwan@uncc.edu) . For urgent issues, illness, or emergency situations, I may be reached at (310) 254-4080.

### **Class Participation**

Class attendance is mandatory. Attendance will be taken at every class. If you miss a class, you need to: 1) email me and the TA to advise them of your planned absence from class, 2) make up the class session by reviewing the lecture and read both required readings, and 3) submit a one-page synopsis of the class to me and the TA within 7 days of the missed class. *If you don't submit the one-page synopsis, you will not get credit for the class.* Meaningful participation is essential to a fruitful experience for all students.

#### Unexcused Absence Policy

- One unexcused missed class – 5% reduction in grade
- Two unexcused missed classes – 10% reduction in grade
- Three unexcused missed classes – 20% reduction in grade
- Four or more unexcused missed classes will result in a zero grade

### **Tardiness**

It is an expectation that everyone will be on time to class. If you are tardy for 3 or more classes without prior approval from faculty, this will also reflect in your discussion grade.

### **Academic Integrity and Honesty**

Students are required to read and abide by the [Code of Student Academic Integrity](#), available from Dean of Students Office. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism (including viewing others work without instructor permission), abuse of academic materials, and complicity of academic dishonesty. Violations of the Code of Student Academic Integrity, including plagiarism, result in disciplinary action as provided by the Code.

### **Civility**

We are concerned with a positive learning experience. This course strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. We value diversity that is beneficial to both employers and society at large.

Students are encouraged to actively and appropriately share their views in class discussions.

### **Non-Discrimination**

All students and the instructor are expected to engage with each other respectfully. Unwelcome conduct directed toward another person based upon that person's actual or perceived race, actual or perceived gender, color, religion, age, national origin, ethnicity, disability, or veteran status, or for any other reason, may constitute a violation of [University Policy 406, The Code of Student Responsibility](#). Any student suspected of engaging in such conduct will be referred to the Office of Student Conduct.

### **Inclement Weather**

University Policy Statement #13 states the University is open unless the Chancellor announces that the University is closed. The inclement weather hotline number to call is 704-687-1900. In the event of inclement weather, check your e-mail, and [Canvas](#). The instructor will post a message on [Canvas](#), and through e-mail. The instructor will use their best judgment as to whether class should be held.

### **Disability**

UNC Charlotte is committed to access to education. If you have a disability and need academic accommodations, please provide a letter of accommodation from Disability Services early in the semester. For more information on accommodations, contact the [Office of Disability Services](#) at 704-687-0040 or visit their office in Fretwell 230.

### **Withdrawal**

The University policy on [Course Withdrawal](#), allows students a limited number of opportunities available to withdraw from courses. There are financial and academic consequences that may result from course withdrawal. If a student is concerned about his / her ability to succeed in this course, it is important to make an appointment to speak with the instructor as soon as possible.

### **Syllabus Revision**

The instructor may modify the class schedule and syllabus throughout the semester. Changes will appear on [Canvas](#). Students are responsible for refreshing their syllabus.