DSBA/HCIP-6160 Big Data Design, Storage, and Provenance Fall 2019
Times: Thursday 12:00pm-2:45pm Location: Center City, 601 Website: https://uncc.instructure.com/courses/110399
Instructor: Dr. Liyue Fan Email: liyue.fan@uncc.edu Office Hours: Th 2:45-4:00pm Center City 713 or per appointment
TA: Lakshmi Nakka inakka@uncc.edu
Course Description
The modeling, programming, integration, and provenance of big data. Focuses on SQL and NoSQL, but may also address other advanced topics. Topics include: (1) modeling/theory: basics of RDBMS and NoSQL database design; (2) programming: SQL and NoSQL query languages; (3) integration: data warehousing, preprocessing; (4) databases in the Cloud; and (5) provenance: data version control, data lifecycle management. 3 credits.

Pre-requisites
Full graduate standing or permission of department.

Course Objectives

- Demonstrate proficiency in SQL programming
- Know and apply general DBMS principles
- Describe and critique key considerations related to advanced topics in DBMS such as NoSQL, cloud systems, provenance, and data lifecycle management
- Experience with data preparation and analytics using relational databases

Like any other skill, your understanding of these concepts will develop only through extensive reading, writing, and practice.

Topic Outlines

- Course Overview, Relational Model Overview, Relational Algebra
- Foundational SQL - Queries
- Intermediate SQL - Advanced Queries, Data Manipulation, Built-in Functions
- Advanced DB design topics: Conceptual Database Design, Normalization; Views, Authorization, Security; Database Administration
- Online Analytical Processing (OLAP) and Data Warehouses
- NoSQL and Cloud Systems
- Data Provenance

Instruction Method

This course will use a combination of classroom instruction, activities, and lab experiments.
Course Materials


Additional readings and material will be available on the Course Web Site (Canvas)

Assignments and Grade Determination

Quizzes/Exams (40%) There will be regular quizzes on the concepts studied in the previous weeks. One or more quizzes will be comprehensive and considered as exams that assess understanding of fundamental concepts and methods. Labs (10%) The in-class labs will give you the opportunity to explore one or more concepts in more depth. Group Project (25%) The group project will enable you to apply these concepts in a small but realistic application. Home Assignments (15%) You will have homework assignments due for almost every class period. Home assignments are to be done individually. Class Participation (10%) Almost every week there will be in-class activities. The participation mark will be a combination of attendance and individual contribution in the activities.

This course will employ a 10 point scale. Final letter grades are assigned as follows:

A = 90% or above B = 80% or above C = 70% or above F = below 70%

Class Preparation

This class is designed in a “flipped” manner so that we can spend our limited, valuable class time answering questions, working out problems, and advancing what you should learn on your own while preparing for class. That means that you are expected to learn most of the basic materials on your own before we meet for class. If you regularly attend class unprepared, please drop this course now and register for another. If you regularly attend class prepared, you're going to learn a lot.

Attendance

You are expected to attend (and participate positively in) every class meeting. No make-up work or extra credit will be set for absences or missed submissions.

The lowest grade on in-class labs will be dropped. Absence verified by Dean of Students office will be excused. https://sass.uncc.edu/services/absence-verification

Positive Class Participation

Positive class discussion and activity is perhaps the most important factor in making the course productive and fun. So
documented (with the University) learning disability that would prevent you from participating in class discussion should notify the instructor at the beginning of the semester. All students who have concerns about participating in class discussion should discuss with the instructor in the first week of class.

Late Policy

Your assignments are considered late if they are not completed by the stated due date and time. If your assignment is late, you have two additional days to complete it for late credit (unless otherwise stated in the syllabus or assignment instructions).工作 received after two days will receive no credit.

Late penalty equals a 20% reduction to the grade you would have received. For example, if you would have received a grade of 90% for completing a particular assignment, you will receive a grade of 70% due to late penalty.

Topics and Assignments

The latest reading and assignments list is available on the course website. The list will be updated as we proceed throughout the semester. Students are responsible for getting up-to-date information on the current readings and assignments.

Syllabus Subject to Change

The instructor reserves the right to alter this syllabus based on best practices that fit changing circumstances.

University Policies

**Code of Student Responsibility:** “The UNC Charlotte Code of Student Responsibility (the Code) sets forth certain rights and responsibilities in matters of student discipline. The Code defines these responsibilities and guarantees you certain rights to ensure your protection from unjust imposition of disciplinary penalties. You should familiarize yourself with the provisions and procedures of the Code” (Introductory statement from the UNC Charlotte brochure about the Code of Student Responsibility). The entire document may be found at this Internet address: [http://legal.uncc.edu/policies/ps-104.html](http://legal.uncc.edu/policies/ps-104.html)

**Academic Integrity:** All students are required to read and abide by the Code of Student Academic Integrity. Violations of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Students are expected to submit their own work, either as individuals or contributors to a group assignment. Definitions and examples of plagiarism and other violations are set forth in the Code. The Code is available from the Dean of Students Office or online at: [http://www.legal.uncc.edu/policies/ps-105.html](http://www.legal.uncc.edu/policies/ps-105.html).

Faculty may ask students to produce identification at examinations and may require students to demonstrate that graded assignments completed outside of class are their own work.

**Course Credit Workload.** This 3-credit course requires 3 hours of classroom or direct faculty instruction and 6 hours of class student work each week for approximately 15 weeks. Out-of-class work may include but is not limited to: required reading and video viewing, written assignments, and studying for quizzes and exams.

**Special Needs:** If you have a documented disability and require accommodation in this course, contact Disability Services, Fretwell 230, phone: 687 4355 voice/TDD the first week of the semester. Information about available services may be obtained at: [http://legal.uncc.edu/policies/ps-51.html](http://legal.uncc.edu/policies/ps-51.html). Accommodations for learning will be arranged by that office and communicated to the
Instructor. If you speak English as a second language, please inform the instructor.

**Diversity Statement:** UNC Charlotte strives to create an academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

All students are required to abide by the UNC Charlotte Sexual Harassment Policy (http://www.legal.uncc.edu/policies/ps-61.html) and the policy on Responsible Use of University Computing and Electronic Communication Resources (http://www.legal.uncc.edu/policies/ps-66.html). Sexual harassment, as defined in the UNC Charlotte Sexual Harassment Policy, is prohibited, even when carried out through computers or other electronic communications systems, including course-based chat rooms or message boards.

**Religious Accommodation:** It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a Request for Religious Accommodation Form to their instructor prior to the census date for enrollment for a given semester http://legal.uncc.edu/policies/ps-134.html. The census date for each semester (typically the tenth day of instruction) can be found in UNC Charlotte’s Academic Calendar (http://registrar.uncc.edu/calendars/calendar.htm).