Catalog Description
A database is an organized collection of data, generally stored and accessed electronically. Database management systems aim to define, manipulate, retrieve and manage data in a database. Design, implementation, query and use of database management systems are covered.

Detailed Description
Data is the blood of businesses. Many businesses like Facebook, Twitter, and Amazon make billions of dollars leveraging their data. Big data could provide new business opportunities by empowering better decisions through data-driven decision-making. Database systems are essential to manage large volumes of data effectively and efficiently, and thus are at the core of management information systems and decision support systems. Given the maxim of ‘garbage in, garbage out’, database systems play a critical role in facilitating business analytics and data science. To help equip students with the imperative knowledge and skills on database systems, this course is designed to provide a comprehensive introduction to managing data using database management systems (DBMS). It consists of three main parts – database design, implementation, and use – with a particular focus on the relational database model. This course provides students with key concepts relating to (i) database management systems, (ii) data analysis and design using entity-relationship diagram (ERD), (iii) database implementation and use based on Structured Query Language (SQL), and (iv) data warehousing. Advanced topics are covered, including big data management systems (e.g., NoSQL) and business analytics.

Course Learning Objectives
Upon completing this course, students will have a useful experience with a leading DBMS software and acquire the core knowledge and skills to:
• Understand the basic concepts of data storage, retrieval, and transformation
• Develop conceptual data models of database based on system requirements
• Develop logical data models from given conceptual data models
• Create/modify/drop tables and columns on databases
• Insert/update/delete data in tables on databases
• Retrieve data from a database table
• Display the results of arithmetic operations in outputs
• Specify searching conditions to restrict rows in outputs
• Join multiple tables to retrieve data from the combined table
**Course Website**
All information and materials pertaining to this course will be available on the Canvas platform (https://uncg.instructure.com/). Students will be responsible for any information or announcements updated on Canvas. All graded deliverables will be submitted electronically through Canvas.

**Course Structure**
This course is Web-based and delivered online. It blends online lectures, assignments, online discussions, and exams. Regular weekly activities consist of three parts:

1. **Online Lectures (asynchronous)**
   
   Online lectures will be delivered in an asynchronous way with recorded videos, which will be uploaded on Canvas Every Monday. Every week, online lectures will be followed by a weekly quick quiz.

2. **Virtual Office Hours (synchronous)**
   
   To assist students’ learning, virtual office hours for Q&A will be running throughout the semester on Zoom. The virtual office hours are every Monday and Tuesday at 7 p.m. – 8 p.m. Students can access the Zoom link provided on Canvas.

3. **Online Hands-on Labs (synchronous)**
   
   In a few of the weeks (upon announcement), there will be Zoom sessions wherein hands-on labs will be delivered synchronously. Supplementary learning materials are available on Canvas. Participation is not mandatory (but strongly encouraged), and recordings will be also uploaded on Canvas.

**Course Materials**
All teaching materials including lecture notes, assignments and other learning recourses needed for this course are available on Canvas.

A. **Required Textbook**
- There is no required textbook. This course is basically based on lecture notes provided on Canvas.

B. **Optional Textbook**
- The following book is helpful to learn DBMS and SQL for this course:

**Software Needed for the Course**
This course makes extensive use of MySQL, a leading open-source software for database management systems, which has been widely used in various industries. No prior knowledge and experience are assumed. Instructions on installation and use of the software will be introduced in the course.
Grading Policy

Assignments 45%
Weekly Quick Quizzes 10%
Midterm Exam 15%
Final Exam 25%
Participation 5%
TOTAL 100%

Letter Grades and Points

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<thead>
<tr>
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<th>Number Grade</th>
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<tr>
<td>A</td>
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<td>72-76.9</td>
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<tr>
<td>A -</td>
<td>90-91.9</td>
<td>C -</td>
<td>70-71.9</td>
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<tr>
<td>B +</td>
<td>87-89.9</td>
<td>D +</td>
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<td>B</td>
<td>82-86.9</td>
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<td>C +</td>
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Assignments 45%
Weekly Quick Quizzes 10%
Midterm Exam 15%
Final Exam 25%
Participation 5%
TOTAL 100%

Assignments
There will be 6 assignments dealing with specific topics in database management systems (details will be posted on Canvas during the course). Assignments are due on the date/time specified in the course.

Late Submission Policy
Late submission will be assessed a grading penalty. Assignments submitted after the due date may not be accepted but, for valid excuses, there will be a minimum of a 20% reduction for each day late.

Data Camp
For some of assignments, students will use Data Camp (https://www.datacamp.com/) which offers interactive online learning environments for data science including database systems and SQL. Students will receive their access credentials during the course.

Weekly Quick Quizzes
Every week, course materials will be followed by a short quiz (multiple choices/filling the blank) on Canvas. They are designed to “quickly” test an understanding of each lecture material.

Midterm Exam / Final Exam
A timed exam is required for the course. The exam will test knowledge of database systems and the use of software. For the university policy regarding the COVID-19, all exams will be taken online.

Participation
For an online course, no physical classroom attendance is required. However, online class participation *(watching online lectures, engaging in online discussion, etc.) is highly recommended* for this course. All of the course content will be covered during the online lectures. Participation grading will be based on online activities on Canvas, which will be automatically recorded by the system (video watching time, page views, number of discussion posts, etc.).

Tentative Class Schedule
The following schedule provides general guidelines and is subject to change. A detailed schedule prior to the beginning of each week will be posted on Canvas. It will include the week’s readings, assignments, instructions, etc. *It is the student’s responsibility to stay on track with course materials and quizzes/assignments to be successful in the course.*

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment/Quiz</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan 18</td>
<td>Introduction to database Management Systems</td>
<td>Quiz 1</td>
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<tr>
<td>2</td>
<td>Jan 25</td>
<td>Entity-Relationship Diagrams (ERD)</td>
<td>Quiz 2</td>
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<td>3</td>
<td>Feb 1</td>
<td>Entity-Relationship Diagrams (ERD) – part 2</td>
<td>Quiz 3</td>
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<td></td>
<td></td>
<td>Assignment 1</td>
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<tr>
<td>4</td>
<td>Feb 8</td>
<td>Introduction to MySQL</td>
<td>Quiz 4</td>
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<tr>
<td>5</td>
<td>Feb 15</td>
<td>Transforming ERD to Relational Model</td>
<td>Assignment 2</td>
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<td>6</td>
<td>Feb 22</td>
<td>Normalization</td>
<td>Quiz 5</td>
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<tr>
<td>7</td>
<td>Mar 1</td>
<td>Midterm Exam</td>
<td>Quiz 6</td>
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<tr>
<td>8</td>
<td>Mar 8</td>
<td>Database Implementation</td>
<td>Assignment 3</td>
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<tr>
<td>9</td>
<td>Mar 15</td>
<td>SQL 1 – Retrieving data from a single table</td>
<td>Quiz 7</td>
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<tr>
<td>10</td>
<td>Mar 22</td>
<td>SQL 2 – Joining data from multiple tables</td>
<td>Assignment 4</td>
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<tr>
<td>11</td>
<td>Mar 29</td>
<td>SQL 3 – Nested subqueries</td>
<td>Assignment 5</td>
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<tr>
<td>12</td>
<td>Apr 5</td>
<td>SQL for Business Analytics (Case Study)</td>
<td>Assignment 6</td>
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<tr>
<td>13</td>
<td>Apr 12</td>
<td>Big Data Management and NoSQL</td>
<td>Quiz 9</td>
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<tr>
<td>14</td>
<td>Apr 19</td>
<td>Review for Final</td>
<td>Quiz 10</td>
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<tr>
<td>15</td>
<td>Apr 26</td>
<td>Final Exam</td>
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➢ Topics and dates can be adjusted depending on the progress of the class.
According to the university policy regarding COVID-19, the schedule for Spring 2021 has been adjusted without the Spring Break. (see https://reg.uncg.edu/calendars/spring-2021-academic-calendar/ for the Academic Calendar)
UNCG Policy & Instruction for COVID-19

As UNCG returns to face-to-face course offerings in fall 2020, the campus community must recognize and address concerns about physical and emotional safety. As such, all students, faculty, and staff are required to uphold UNCG’s culture of care by actively engaging in behaviors that limit the spread of COVID-19. Such actions include, but are not limited to, the following:

- Wearing a face covering that covers both nose and mouth
- Observing social distance in the classroom
- Engaging in proper hand washing hygiene when possible
- Self-monitoring for symptoms of COVID-19
- Staying home if you are ill
- Complying with directions from health care providers or public health officials to quarantine or isolate if ill or exposed to someone who is ill.

Instructors will have seating charts for their classes. These are important for maintaining appropriate social distance during class and facilitating contact tracing should there be a confirmed case of COVID-19. Students must sit in their assigned seat at every class meeting and must not move furniture. Students should not eat or drink during class time.

A limited number of disposable masks will be available in classrooms for students who have forgotten theirs. Face coverings will also be available for purchase in the UNCG Campus Bookstore. Students who do not follow masking and social distancing requirements will be asked to put on a face covering or leave the classroom to retrieve one and only return when they follow these basic requirements to uphold standards of safety and care for the UNCG community. Once students have a face covering, they are permitted to re-enter a class already in progress. Repeated issues may result in conduct action. The course policies regarding attendance and academics remain in effect for partial or full absence from class due to lack of adherence with face covering and social distancing requirements.

For instances where the Office of Accessibility Resources and Services (OARS) has granted accommodations regarding wearing face coverings, students should contact their instructors to develop appropriate alternatives to class participation and/or activities as needed. Instructors or the student may also contact OARS (336.334.5440) who, in consultation with Student Health Services, will review requests for accommodations.

Health and well-being impact learning and academic success. Throughout your time in the university, you may experience a range of concerns that can cause barriers to your academic success. These might include illnesses, strained relationships, anxiety, high levels of stress, alcohol or drug problems, feeling down, or loss of motivation. Student Health Services and The Counseling Center can help with these or other issues you may experience. You can learn about the free, confidential mental health services available on campus by calling 336-334-5874, visiting the website at https://shs.uncg.edu/ or visiting the Anna M. Gove Student Health Center at 107 Gray Drive. For undergraduate or graduate students in recovery from alcohol and other drug addiction, The Spartan Recovery Program (SRP) offers recovery support services. You can learn more about recovery and recovery support services by visiting https://shs.uncg.edu/srp or reaching out to recovery@uncg.edu.
Statement of Students’ Rights and Responsibilities
As a student in my class, you have explicit rights and responsibilities. Your full understanding and acceptance of the following rights and responsibilities can lead to more effective learning and more productive use of our time together.

You have the right to expect:
1. Your professor to be prepared for each class, to start class promptly at the designated time and to end class at the designated time.
2. Your professor to teach all scheduled classes or arrange for a qualified substitute if it is necessary to miss class because of illness or University approved commitments.
3. Clear statements of course expectations, policies, testing and grading practices and student performance.
4. Your professor to hold a reasonable number of office hours to discuss assignments or to assist you with course matters.
5. Knowledgeable assistance from your professor regarding class assignments and course content.
6. Professional behaviors reflecting equitable treatment, ethical practices and respect for your rights.
7. Opportunities to challenge ideas and defend your beliefs in a professional manner.
8. To be challenged to grow both academically and professionally.
9. Information regarding career opportunities related to ISM programs.
10. Your professor to abide by University policies.
11. Fairness and clarity in evaluation of your performance.
12. Adequate opportunity to appeal any perceived violations of the above rights.

You have specific responsibilities to:
1. Plan your study and work schedule appropriately to allow sufficient time to do quality class work. I suggest you devote at least 6 to 8 hours per week to this class.
2. Arrive at each class on time and be prepared to discuss assigned readings and participate in discussions.
3. Complete assignments by due date and submit quality work.
4. Understand and follow course policies as explained in class and in the syllabus.
5. Commit yourself to grow both academically and professionally.
6. Work effectively and cooperatively as a team member on group projects if so assigned.
7. Practice ethical behaviors and display respect for rights of others.
8. Contact your instructor and discuss circumstances which may prevent acceptable performance and to make such contact on a timely basis.