Syllabus: Fall 2023

CPSC 321: Database Management Systems

Lectures: Tu/Th, Section 1: 1:50–3:05 (Paccar 005), Section 2: 10:50–12:05 (Paccar 107)

Instructor: Shawn Bowers (bowers@gonzaga.edu), BCISE 009

Graders: Kevin Dang (kdang@zagmail.gonzaga.edu), Vincent Do (ndo2@zagmail.gonzaga.edu).

Office Hours: Tu/Th 3:30-4:30, Wed 1:30-3:30, or by appointment.

Course Description: This course provides an introduction to topics in database management as well as hands-on experience working with a relational database system. Topics covered include the relational model, query languages (relational algebra and SQL), database design (conceptual modeling, integrity constraints, and normalization), indexing, basic query processing, and transaction management. This course includes weekly assignments and a larger project where students independently design and develop a database application.

Prerequisites: CPSC 122 or CPSC 222.

Course Supplies: There is no textbook for the course. Students must have a GitHub account for homework.

Access to Course Materials: Lecture notes, homework, and a weekly schedule will be made available on the course webpage (www.cs.gonzaga.edu/bowers/courses/cpsc321). Canvas (canvas.gonzaga.edu) will be used for posting grades. Piazza (piazza.com/gonzaga/fall2023/cpsc321) will be used for questions, discussions, and course announcements.

Grading: Grades are based on the number of points earned throughout the semester. A total of 700 points is possible. Additional points beyond the 700 may also be available as extra credit. Points are allocated across the following areas (excluding extra credit).

<table>
<thead>
<tr>
<th>Point Total</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>280</td>
<td>Homework</td>
<td>8 assignments worth 35 points each</td>
</tr>
<tr>
<td>70</td>
<td>Project</td>
<td>individual project</td>
</tr>
<tr>
<td>100</td>
<td>Quizzes</td>
<td>10 quizzes at 10 points each</td>
</tr>
<tr>
<td>200</td>
<td>Exams</td>
<td>1 midsemester exam and one final exam at 100 points each</td>
</tr>
<tr>
<td>50</td>
<td>Attendance</td>
<td>≈ 25 class meetings (15 weeks) at 2 points per meeting</td>
</tr>
</tbody>
</table>

Letter grades are assigned based on the total number of points earned over the semester as follows.

A+ = 644+  C+ = 532–572
A- = 623–643  C = 504–531
B+ = 602–622  C- = 483–503
B = 574–601  D+ = 462–482
B- = 553–573  D = 434–461

IMPORTANT: In addition, to pass the class you must earn at least 210 points (60%) towards homework (which includes the final project and homework assignments) and 180 points (60%) towards exams and quizzes. Extra credit points are added to total points earned and not any specific category.

Course Policies:

Student Expectations: As a student, you are responsible for understanding and learning the course material. If you do not understand topics discussed in class, or instructions on tests or assignments, it is your responsibility to ask for help from the instructor. You can get help from the instructor during office hours, via email, or using the Piazza system set up for the course. Please start your assignments early to leave yourself enough time to ask questions and to complete the assignment once your questions are answered.
**Assignment Grading:** All work must be turned in on or before the due date for full credit. It is expected that all homework and project work turned in is the work of the student. Any violation of this rule will result in a grade of 0 and/or an F in the course as well as possible suspension from the University.

**Assignment Late Policy:** Late homework will be accepted with a 20% penalty (7 points) if turned in up to one week after the due date. Late work cannot be turned in for credit after the one-week late period. No work will be accepted after the last day of finals week.

**Quizzes and Exams:** All exams and quizzes are to be done individually. Clear cases of collaboration will result in a grade of 0 on the exam or quiz and/or an F in the course as well as possible suspension from the University. Students with testing accommodations must contact the instructor to arrange alternative testing times as needed. There are no make-up quizzes, and missed quizzes receive 0 points.

**Attendance:** It is important that you attend class and keep up with course content and assignments. If you become ill or have another emergency that prevents you from attending class, contact the instructor as soon as possible to make alternative arrangements. You will receive up to 2 points per class period. These points will be based on attendance and class participation. If you are unable to attend class due to an illness or other emergency, you must notify the instructor as soon as possible to discuss your situation and determine a suitable course of action.

**Office Hours:** You are strongly encouraged to take advantage of office hours or make an appointment to meet with the instructor if you have questions about the course material. Office hours are a great way to ask questions and get one-on-one help with the material.

**Academic Integrity:** You are expected to follow the University’s policy on academic integrity. Please see the policy on the University’s webpage for more information, including procedures for violations. If you are unclear about the policy or how it applies to this class please ask the instructor.

**Incomplete Grades:** University Policy states that incomplete grades can be “Given when a student with a legitimate reason as determined by the instructor, does not complete all the work of the course within the semester that he/she is registered for the course.” A grade of incomplete is given to students who find themselves in situations beyond their control and that make academic success near to impossible. The Center for Cura Personalis and Academic Advising & Assistance are available to help in such situations. A grade of incomplete will not be granted for students due to a heavy course workload or because they have fallen behind in their coursework due to inadequate time management.

**ABET Specific Outcomes of Instruction:** Students completing the course will:

1. Design and implement a relational database schema
2. Compare trade-offs between different relational representations of the same database schema
3. Formulate SQL select-from-where queries as well as queries involving joins, aggregation, grouping, and subqueries
4. Translate basic SQL queries into relational algebra expressions
5. Create ER diagrams based on application requirements
6. Identify redundancy in relational schema designs and apply simple normalization approaches (e.g., decomposition into BCNF and 3NF)
7. Define and create appropriate database indexes
8. Identify serializable schedules and recovery actions for transactions
9. Develop an end-to-end database application using a modern relational database system and dynamic SQL
10. Approximate the cost of evaluating simple SQL queries

**University Academic Policies & Procedures:** A full list of academic policies and procedures at the University are available at: www.gonzaga.edu/academics/academic-calendar-resources registrars-office/policies-procedures/academic-policies-procedures. Note that new policies are added and modified frequently.