CPSC 321: Database Management Systems
SYLLABUS — Fall 2018

Time and Location: T/H 1:50 PM - 3:05 PM, PACCAR 005
Prerequisites: CPSC 122
Instructor: Shawn Bowers, bowers@gonzaga.edu, Herak 309C
Office Hours: W 1:00 PM - 3:00 PM, T/H 9:30 AM - 10:30 AM, or by appointment.
Course Webpage: www.cs.gonzaga.edu/bowers/courses/cpsc321
Required Textbook:


Course Materials: Lecture notes, homework assignments, and general class information will be made available on the course webpage. We will also use the Piazza system for class discussions outside of lectures. Be sure to check both the course webpage and Piazza often for updates.

Course Description: The goal of this course is to provide an introduction to topics in data management as well as hands-on experience working with relational database systems. Topics covered include the relational data model, query languages (relational algebra and SQL), database design (conceptual modeling, integrity constraints, and normalization), storage and file structures, query processing and optimization, and transaction management (as time allows). This course has a strong design and engineering emphasis that includes weekly assignments and a group project in which students design and develop an end-to-end database application.

Grading:
30% — Assignments
10% — Project
15% — Quizzes
45% — Three mid-semester exams

Opportunities may also be provided for extra credit. Letter grades will be assigned based on the standard percentage scales (A: 93–100%, A-: 90–92%, B+: 87–89%, B: 83–86%, B-: 80–82%, C+: 77–79%, C: 73–76%, C-: 70–72%, D+: 67–69%, D: 60–66%, F: 0–59%).

Course Policies:
Assignments. All assignments (written homework, programming homework, and projects) must be turned in during the scheduled class period of the given due date. NO LATE ASSIGNMENTS WILL BE ACCEPTED. If you expect to miss class when an assignment is due, turn your assignment in prior to the due date.

Exams and Quizzes. Makeup exams will only be given in cases of medical, personal, work-related, or other emergencies. If an emergency arises and you are going to miss an exam, contact me as soon as possible to arrange an alternative exam time. Quizzes are worth 10 points each, and quizzes are worth 15% of your final grade. If you miss a quiz, you will receive 0 points for that quiz. NO MAKEUP QUIZZES WILL BE GIVEN.
**Attendance.** It is important that you attend class. The Gonzaga University Catalog states that exceeding two weeks of class constitutes a grade of V. If an *extraordinary* situation (medical, personal, work-related, or other emergency) prevents you from working for an extended period of time, contact me as soon as possible to discuss your situation and to arrange a special schedule (if appropriate). Otherwise, your absence will be treated as unexcused.

**Academic Honesty:** You are expected to follow the university policy on academic honesty. Examples of academic dishonesty regarding programming assignments include: turning in the work of another student and representing it as your own work, knowingly permitting another student to turn in your work, copying code from another student or online resource, and deliberately transforming borrowed sections of your code to disguise its origin. Note that you can still have *general* discussions about assignments, e.g., concerning requirements, debugging approaches, and the general ideas involved in an assignment. When in doubt about the policy, please ask for clarification.

**Use of Electronic Devices in Class:** Please do not make inappropriate use of electronic devices during class times (e.g., laptops, tablets, or phones). These devices should not be used during class to browse the web, text/instant message, check email, etc. Also, please be sure to put your phone in “silent” mode during class.

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

**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 embedded SQL
10. Approximate the cost of evaluating simple SQL queries

**University Statement Regarding Course Expectations:** As a Jesuit university that seeks to provide an equal opportunity to learn for all students, this course is offered with the expectation that students are here voluntarily, and understand that the university expects all interactions relating to its courses to occur in the context of a professional academic work environment that is welcoming and accessible to all students regardless of gender, race, ethnicity, religion, disability, sexual orientation or identity and any other non-merit factor in educational programs or activities. This environment includes virtual course environments, such as Blackboard, and any course-related communications via e-mail and social media. We strive to create a healthy environment
conducive to intellectual honesty and free inquiry; as such, behaviors which constitute harassment, discrimination, or hostile and/or inappropriate conduct will not be tolerated, and faculty, staff and administrators will take action to ensure such matters are addressed promptly and appropriately. For inquiries or concerns about non-discrimination or the complaint process at Gonzaga, contact the Office of Equity and Inclusion, Business Services Center, 102 E. Boone Avenue.

**University Note on Harassment, Discrimination and Sexual Misconduct:** Consistent with its mission, Gonzaga seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX and Gonzaga's policy prohibit gender-based harassment, discrimination and sexual misconduct. Gonzaga encourages anyone experiencing gender-based harassment, discrimination or sexual misconduct to talk to someone from the Campus and Local Resources list found in the Gonzaga Harassment and Non-Discrimination Policy. It may be helpful to talk about what happened in order to get the support needed and for Gonzaga to respond appropriately. There are options for support and resolution, namely confidential support resources, and campus reporting and support options available. Gonzaga will respond to all reports of sexual misconduct in order to stop the harassment or misconduct, prevent its re-occurrence and address its effects. Responses may vary from support service referrals to formal investigations. As a faculty member, I want to get you connected to the resources here on campus that can help you in this situation and therefore will report all incidents of sexual misconduct and thus cannot guarantee confidentiality. I will provide our Title IX coordinator with relevant details such as the names of those involved in the incident, and Title IX will reach out to you to explore options for support, safety measures and reporting. For inquiries or concerns about gender-based harassment, discrimination or sexual misconduct or the complaint process at Gonzaga, contact the Title IX Coordinator, Business Services Center, 102 E. Boone Avenue.

**University Notice to Students with Disabilities/Medical Conditions:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability/medical condition requiring an accommodation, please call or visit the Disability Access Office.