

COMP 340 — Databases — Spring 2018  
CRN 28289

**Instructor:** Phillip Kirlin  
**Meetings:** Tu/Th, 11–12:15, Briggs 119  
**Course website:** <http://www.cs.rhodes.edu/db>  
**Email:** [kirlinp@rhodes.edu](mailto:kirlinp@rhodes.edu) (please include “Databases” somewhere in the subject)  
**Office hours:** See website for scheduled office hours; I am always available by appointment.

**Course Overview:** Database systems are at the core of large-scale information management, providing the most efficient mechanism for storing, updating, and retrieving structured data. This course will provide an introduction to the design and use of database systems, as well as the key issues in building such systems. Topics include the relational model, logical database design, query languages, and database implementation issues such as storage and indexing, query processing and optimization, concurrency control, and transaction management. In addition to traditional database topics, this course will also provide an introduction to key technologies for managing and exchanging data on the World Wide Web.

**Text:** Ullman and Widom, *A First Course in Database Systems*, third edition, 2008.

**Prerequisites:** COMP 241 (Data Structures and Algorithms). Knowledge of programming in Python and C++ is assumed. Students should have enough confidence in their programming abilities to debug programs effectively, locate and understand documentation for specific language features, and independently write programs of considerable complexity.

**Course Work:**

	Tentative weight	Tentative date
Homework	30%	
Course project	25%	
Midterm	20%	Thursday, March 15, in class
Comprehensive final exam	25%	Saturday, May 5, 1pm

Final letter grades of A–, B–, C–, and D– are guaranteed with final course grades of 90%, 80%, 70%, and 60%, respectively. If your final course grade falls near a letter grade boundary, I may take into account class participation, attendance, and/or improvement during the semester.

Any written assignments are due at the beginning of class on the assigned date. In general, late work will not be accepted, so turn in whatever you have completed by the due date. Homework assignments should be written neatly. Poorly written work will not be graded. All pages of assignments should be stapled together.

If you have a valid reason for a makeup exam, inform your instructor as soon as you know. A valid reason is a medical emergency, a death in the family, religious observation, a college-sponsored off-campus activity, and, quite frankly, very little else. Generally, assignment extensions will only be granted for *unplanned* circumstances (e.g., the first two reasons above).

**Office Hours:** In addition to regular office hours, am also available immediately after class for short questions. You never need an appointment to see me during regular office hours; you can just come by. Outside of regular office hours, feel free to stop by my office, and if I have time, I’ll try to help you. If I don’t have time at that moment, we’ll set up an appointment

for a different time. Don't be shy about coming by my office or sending me email if you can't make my regular office hours. I always set aside time each week for "unscheduled" office hours.

**Attendance:** Attendance is expected for each class. If your attendance deteriorates, you will be referred to the dean and asked to drop the course. Attendance, participation, and apparent overall improvement trend may be considered in assigning a final grade. Attendance will be checked each class lecture period. After five unexcused absences, each additional absence will reduce the final grade for the course by one letter grade.

**Class Conduct:**

- I encourage everyone to participate in class. Raise your hand if you have a question or comment. Please don't be shy about this; if you are confused about something, it is likely that someone else is confused as well. Teaching and learning is a partnership between the instructor and the students, and asking questions not only helps you understand the material, it also helps me know what I'm doing right or wrong.
- Do not use your cell phone while in class, and keep the ringer on silent.
- If you cannot make it to class for whatever reason, make sure that you know what happened during the lecture that you missed. It is your responsibility, and nobody else's, to do so. The best way to do this is to ask a classmate.
- If you have to leave a class early, inform the instructor in advance. It is rude to walk out in the middle of a lecture.

**Students With Disabilities:** If you have a documented disability and wish to receive academic accommodations, please contact the Office of Student Disability Services at x3885 as soon as possible.

**Collaboration:** Students should talk to each other about the subject matter of this class and help each other. It is fine to discuss the readings, lectures, and problems and ask questions about them. I encourage such questions in class as well as elsewhere. However, there is a line past which you must not go, e.g., copying a solution from a fellow student, book, website, etc. will cause you to fail the course, or worse. If a significant part of one of your solutions is due to someone else, or something you've read, then you must acknowledge your source. Failure to do so is a serious academic violation. Of course, even after you acknowledge your source you must still understand your solution and write it in your own words. Copying a solution from the web, a book, or classmate will result in failure even if you acknowledge your source, unless you put it in quotation marks and say something like, "Here is Amy's solution, but I don't understand it enough to absorb it and write it in my own words." However, this won't get you much — if any — credit.

A good rule of thumb to follow is to not write up any solutions to homework assignments in a group. Feel free to discuss things with your classmates, but the solution should be written alone.

**Academic Integrity:** Plagiarism, cheating, and similar anti-intellectual behavior are serious violations of academic ethics and will be correspondingly penalized. If you are concerned about a possible violation of this kind, please talk with me. I understand that being a student at

Rhodes can be stressful sometimes and you will have many demands on your time. However, I would much rather have you turn in a partially-completed assignment or do poorly on a test than have you violate the Rhodes Honor Code. I can — and very much want to — help you if you don't understand the material, but violations of academic integrity will be dealt with harshly.

Unless otherwise specified, everything you submit in this course must be your own work and represent your individual effort. These are all included in the definition of reportable Honor Code violations for this course: copying all or part of a solution to a problem, downloading a solution from the internet and submitting it as your own, having someone else provide the solution for you, or allowing someone else to copy from you. If you have any doubt about what type of behavior is acceptable, please talk with me.

**Diversity:** A diverse learning community is a necessary element of a liberal arts education, for self-understanding is dependent upon the understanding of others. We are committed to fostering a community in which diversity is valued and welcomed. To that end any discrimination or harassment on the basis of race, gender, color, age, religion, disability, sexual orientation, gender identity or expression, genetic information, and national or ethnic origin, will not be tolerated in the classroom.

We are committed to providing an open learning environment. Freedom of thought, a civil exchange of ideas, and an appreciation of diverse perspectives are fundamental characteristics of a community that is committed to critical inquiry. To promote such an academic and social environment we expect integrity and honesty in our relationships with each other and openness to learning about and experiencing cultural diversity. We believe that these qualities are crucial to fostering social and intellectual maturity and personal growth.

Intellectual maturity also requires individual struggle with unfamiliar ideas. We recognize that our views and convictions will be challenged, and we expect this challenge to take place in a climate of open-mindedness and mutual respect.

## Course Topics

- The relational data model
- Structured query language (SQL)
- Entity-Relationship modeling
- Designing database-driven websites using Flask
- Database design theory (functional dependencies, normalization, and decomposition)
- Under the hood: indices, query optimization, transactions, B-trees
- Other data models besides relational as time permits