INFO 610 (3 Credits)
Analysis and Design of Database Systems
Fall 2024: 8/20/2024-12/9/2024
Section 901, CRN: 13461, Term: 202510

vcubusiness | Virginia Commonwealth University

Schedule: Tuesdays 7:00pm-9:40pm
Delivery: ROND - Online, Synchronous
Location: Online via Zoom

Faculty: Dr. Amita Goyal Chin, agchin@vcu.edu
Office Hours: Online via Email, Zoom, etc. and in-person by appointment

Important Dates: https://academiccalendars.vcu.edu
Last day to withdraw with a "W" is Friday, October 25, 2024

From the VCU Bulletin:

> **INFO 610. Analysis and Design of Database Systems. 3 Hours.**
> Semester course; 3 lecture hours (delivered online, face-to-face or hybrid). 3 credits. Prerequisite: **INFO 364**. Designed to prepare students for the development of data-driven information systems using advanced database management techniques. Included are topics related to advanced SQL statements, procedural SQL programs and NoSQL databases.

I. Online Learning Environment & Canvas

ROND (Online, Synchronous) is a course format that provides required contact hours for the course in synchronous (online) instruction. You must be extra careful to not fall behind in the class and to meet all the deadlines set in the class. You must be comfortable using technology, and you must have ready access to a reliable computer and internet connection. All online work may be completed from the physical location of your choice. We will use Canvas as our LMS.

Tips for Success

- Your self-motivation and self-pacing are critical. For this course, you should plan to work at least 10 hours per week outside of class. Be sure to plan your time accordingly. Study and practice as you go instead of cramming at the last minute.

- Make yourself a calendar with ALL your due dates across ALL your courses. Plan for when you will work on each course so that you can complete the required work in advance of the due dates.

II. Course Objectives & Student Learning Outcomes

This course prepares students for the development of data-driven information systems using advanced database management techniques. Upon successful completion of the course students will:

- be able to write advanced SQL statements
- understand physical storage levels
- understand basic concepts of indexes and how to select and create indexes
- understand concepts of transactions and concurrency control

III. PreRequisite - INFO 364

IV. Course Materials

(1) **Online Resources** – will be provided on Canvas.

(2) **Recommended Textbook Resources:**

Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan

- Description: This book offers a comprehensive overview of database systems, including advanced topics such as transaction management, query optimization, and distributed databases. It's known for its clear explanations and practical approach.
- Strengths: Thorough coverage of both fundamental and advanced topics, with good exercises and examples.
- Edition: 7th Edition (2020).
- A (free) pdf of this textbook is available for download at: https://github.com/FrenzyExists/programming-books/blob/master/Databases/Database-System-Concepts-7th-Edition.pdf
- A (free) compilation of ppt files is available at: https://www.db-book.com/slides-dir/index.html

Fundamentals of Database Systems by Ramez Elmasri and Shamkant B. Navathe

- Description: This textbook offers a comprehensive introduction to database systems, with coverage of both foundational and advanced topics. It's suitable for graduate courses focusing on a broad range of database concepts.
- Strengths: Comprehensive coverage with clear explanations and practical examples.
- Edition: 7th Edition (2020).
- A (free) pdf of this textbook is available at: http://debracollege.dspaces.org/bitstream/123456789/168/1/Fundamentals-of-Database-Systems-Pearson-2015-Ramez-Elmasri-Shamkant-B.-Navathe.pdf

Database Management Systems by Raghu Ramakrishnan and Johannes Gehrke

- Description: This textbook provides an in-depth treatment of database design, query processing, and advanced topics such as data warehousing and data mining. It's widely used in graduate courses for its clarity and comprehensive content.
- Strengths: Strong focus on theoretical foundations and practical aspects of database systems.
- Edition: 3rd Edition (2002).
- A (free) pdf of this textbook is available at: https://archive.org/details/ramakrishnan-database-management-systems-3rd-edition/page/n15/mode/2up

Principles of Database Systems by Jeffrey D. Ullman

- Description: Known for its rigorous approach to database theory, this book delves into relational theory, data models, and algorithms. It's ideal for students seeking a deep theoretical understanding of databases.
- Strengths: Detailed theoretical insights, including formal aspects of database design and query languages.
- Edition: 1st Edition (1982), though newer resources may complement it.

V. Course Schedule - Please review the Course Schedule on Canvas.

VI. Attendance and Assessments Policy

(1) Attendance and class participation are very important in developing the logic and problem-solving skills that this class requires, and to obtain a full understanding of the concepts covered. We will be working on practice exercises and discussion questions during class. Unannounced quizzes and extra credit opportunities may also be given during class meetings.

(2) All students must complete all assessments at the scheduled times and must submit via Canvas before the deadline. Email submissions will not be accepted.

(3) Please note that all graded work is **individual** work (unless otherwise specified), and outside help is not allowed. This includes, for example, friends, colleagues, Chegg, ChatGPT, etc.

VII. Grade Computations

All grades will be posted on Canvas. Any discrepancies in the posted grades must be identified and discussed with me within 24 hours of posting. After this time, grades are final and cannot be changed.

The final course grade is computed as follows:

(1) Homework – 10%

(2) Exam 1 – 25%

(3) Exam 2 – 25%

(4) Semester (Team) Project & Presentation – 40%

Final course grades will be determined as follows:
A >= 90% B >= 80% C >= 70% D >= 60% F = below 60%

VIII. Mastering Technology Issues

When dealing with technology, there will be problems. Most likely, you will face a problem with your computer or Canvas during the semester. Technology issues, however, are not an excuse for missing deadlines. Please avoid last minute issues by starting and completing work early. You may contact the VCU IT Help Center regarding technology problems.

IX. About VCU School of Business

At the intersection of business and innovation is Virginia Commonwealth University's Business School, which aims to develop world-ready business leaders and produce game-changing research.

Since its beginning in 1937, the VCU Business School has grown into a nationally ranked institution with over 40,000 alumni who have made their mark on the business world and beyond.

Offering a wide range of programs at the bachelor's, master's, certificate and doctoral levels, the VCU Business School ranks in the top five percent of business schools worldwide due to its AACSB International accreditation. The school maintains strong connections with the vibrant business community that surrounds our campus and provides students with transformative educational experiences that enhance their lives using education as a bridge to their future success.

X. VCU Libraries

Use VCU Libraries to find and access library resources, spaces, technology and services that support and enhance all learning opportunities at the university. (https://www.library.vcu.edu/)

XI. VCU Institutional Policies

Students should visit http://go.vcu.edu/syllabus and review all syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.