CS432: Databases

Introduction to Databases

Instructor
Yogesh K. Meena

Lecture no.
1

CSE, IIT Gandhinagar
January 7, 2025

Pre-course Assessment

- Branch (Course), Degree, Year
- Prerequisites
- Motivation and Expectations
- Prior Knowledge and Interests
- Career Aspirations
- Personal Technology Experience
- Favorite Technology Interface

Course Information

- **Course Plan:**
  - https://docs.google.com/document/d/1ZImZm5g76sNny1Jx1fhpTM_qmCus95Dj/edit
  - course website: https://yogeshkmeena.github.io/Teaching/
- **Google Group and Classroom**
  - https://groups.google.com/a/iitgn.ac.in/forum/#!forum/cs432_databasejan-may-2026.pvtgroup@iitgn.ac.in

Course Timings and Contact Details

Meeting Times

- Class: [P1] Wednesday (5:00 PM – 6:20 PM @ 10/103)
- Class: [P2] Friday (5:00 PM – 6:20 PM @ 10/103)
- Venue: AB10/103
- Office Hours: Monday (15:00 – 17:00)
- Office: AB13/401A

Contact

- Email: yk.meena@iitgn.ac.in
- Webpage: `https://labs.iitgn.ac.in/haix/team/`

Teaching Assistants

- Ramanand, CSE PhD student, 24310048@iitgn.ac.in [LeadTA]
- Porika Rakesh, CSE PhD student, porika.rakesh@iitgn.ac.in [LeadTA]
- Sreejan, CSE MTech student, sreejan.24250093@iitgn.ac.in
- Madhusudhanan K, CSE MTech student, madhusudhanan.k@iitgn.ac.in
- Sankalp Sunil Turankar, CSE MTech student, sankalp.turankar@iitgn.ac.in

Reference Books

- Silberschatz, Korth, Sudarshan — *Database System Concepts*, 6th Ed.
- Hellerstein, Stonebraker — *Readings in Database Systems*, 4th Ed.
- Elmasri, Navathe — *Database Systems*, 6th Ed.

Lecture Material

- Lecture Slides (course website)
- Reference Books (Institute Library)
- Research and White Papers (online)

Course Evaluation Scheme

- Exam 1: **30%**
- Assignments / Mini-projects (4): **40%** (10% each)
- Surprise Quizzes (3): **24%** (8% each)
- Attendance: **6%**

Assignments/Mini-projects: Track 1

- Database (SQL) and UML development
- Application and B+ tree development
- ACID testing on the Application and the B+ tree (Integration of central DB)
- Sharding of a developed application (will be tested in a simulated environment by TAs)
- Note: Testing on the B+ tree will be done on 1 million records in part 2 and ACID testing will be done using 1 billion records in part 3

Assignments/Mini-projects: Track 2

- Data interpretation (Data Parsing/ETL)
- Query creation for storing data
- Development of an instruction set for users
- Finalisation and operational testing with 5 different types of applications.

Course Contents

- Introduction to RDBMS
- Structured Query Language (SQL)
- Relational Algebra and ER Model
- Database Design
- Storage and File Structures
- Indexing and Hashing
- Query Processing and Optimization
- Transactions and Concurrency Control
- Recovery Systems
- Introduction to NoSQL Databases

Case studies

- e.g., AWS global outage
- e.g., Cloudflare global outage
- e.g., Google Cloud Outage etc.