

CS422 Principles of Database Systems  
Course Overview

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### Database Management Systems (DBMS)

- Efficient
- ACID
- SQL

### The Big Picture

### Database

**students**

id	name	address
1	John	123 Main St.
2	Jane	456 State St.

**departments**

name	acronym
Computer Science	cs
Mathematics	math

**Other**

- views
- indexes
- functions/procedures

### Schema

**students**

id	name	address
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**departments**

name	acronym
------	---------

**Other**

- views
- indexes
- functions/procedures

### Schema

**students**

id	name	address
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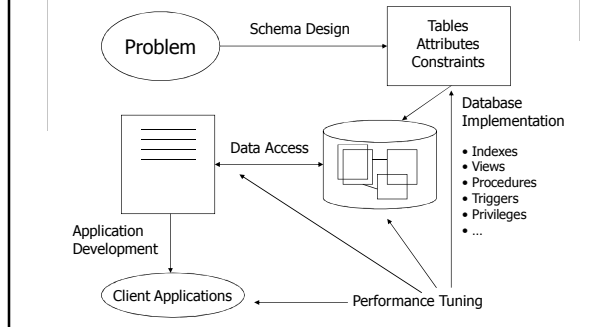
**departments**

name	acronym
------	---------

**Other**

- views
- indexes
- functions/procedures

## Database Development



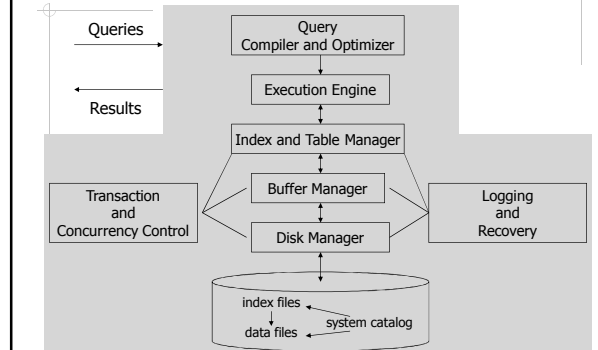
## Schema Design

- ◆ Entity-Relationship (ER) model
- ◆ Relational model
- ◆ ER → Relational conversion
- ◆ Normalization

## Implementation and Access

- ◆ SQL
- ◆ Transactions
- ◆ Stored procedures and triggers

## DBMS Internals



## Database Internals

- ◆ Query processing
- ◆ Disk access
- ◆ Record organization
- ◆ Memory management
- ◆ Concurrency control
- ◆ Failure recovery
- ◆ Indexes