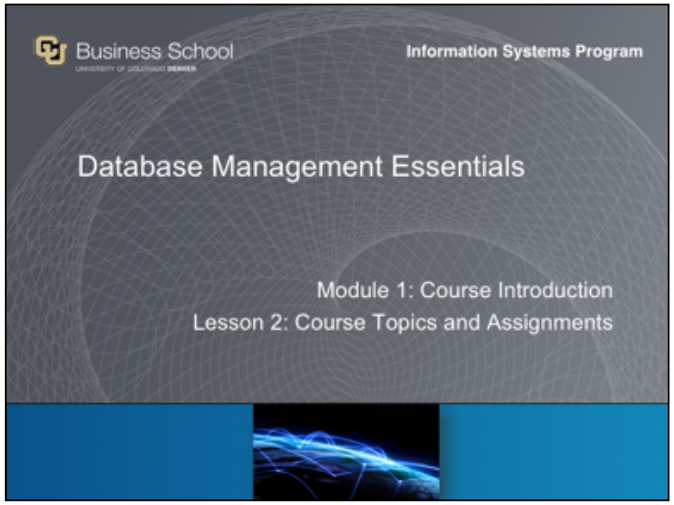


Welcome to Database Management Essentials (Course 1) of the specialization of Data Warehouse Essentials for Aspiring Business Intelligence Professionals

Fun but challenging track for both business and computer science students as well as information technology professionals

Learn new concepts, skills, and practices vital to careers in data warehouses and business intelligence

Introductory course on database management concepts and skills

Other courses deal directly with data warehouse concepts, technologies, and skills.

Database management is crucial to the operation and management of modern organizations:

- infrastructure (plumbing) for daily business operations
- raw materials for long range decision making



Transformation: as significant as learning computer programming and algebra

Objectives:

- Cover course topics, assignments, and tools
- Provide excitement for this course and the entire track

Data warehouses provide key infrastructure for business intelligence services used in many organizations. Management of large, complex data warehouses involves technical skills and conceptual background needed by information systems professionals as well as tactical and strategic issues faced by information technology managers. According to a recent report by McKinsey, demand for graduates with business intelligence skills is large and growing with a projected shortfall of 1.5 million analysts by 2018.

Before learning about data warehouses, students need a basic background in database management. This course provides this foundation in query formulation and database development so that students can progress to topics specific to data architectures that support business intelligence.

## Lesson Objectives

- Understand course topics and course flow
- Understand assessments especially practice and graded problems
- Obtain software

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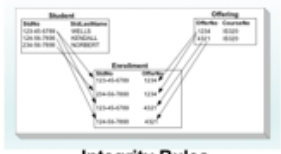
Business School

Information Systems Program

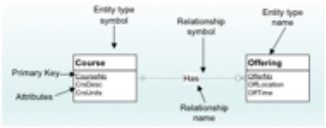


## Course Topics



Integrity Rules


Query Formulation




Data Modeling

Table Design

3

Business School

Information Systems Program

Unit 1: concepts, database creation, query formulation, data modeling, normalization

Unit 2:

- SQL history
- Basic SQL SELECT statements
- Problem solving aids
- Advanced SELECT statements
- Other SELECT statements: union, data manipulation
- Data retrieval problems

Unit 3:

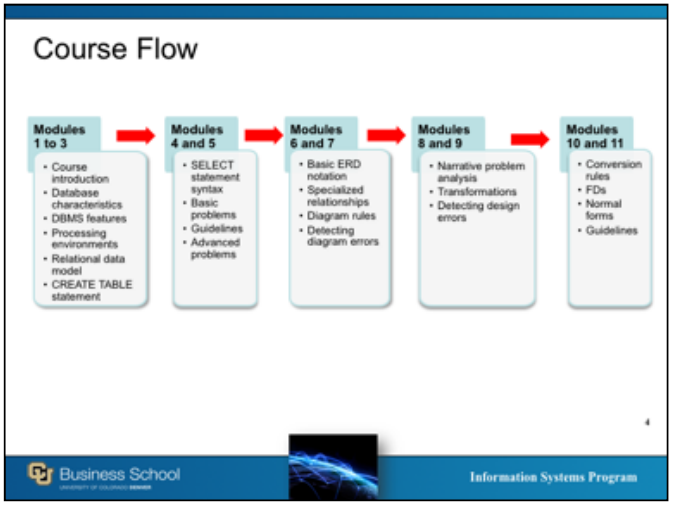
- ERD notation and examples
- ERD notation rules (structural)
- Finding and resolving diagram errors

Unit 4:

- Analyzing narrative problems
- Data modeling transformations and consistency checking
- Finding and resolving design errors

Unit 5
- Conversion rules
- Functional dependencies
- Boyce Codd Normal form
- Normalization usage
- Conversion and normalization problems






On demand so not strictly week. Roughly one unit per week.

Unit 1
- 3 modules: intro, database characteristics and DBMS features, relational data model and CREATE TABLE statement
- Concepts: database characteristics, DBMS features, processing environments
- Skills: relational model integrity constraints and CREATE TABLE statement

Unit 2
- 2 modules: basic query formulation, advanced query formulation
- Syntax of SQL SELECT statement and SQL background
- Basic query formulation problems involving two table joins and grouping
- Query formulation guidelines: SELECT statement processing and critical questions
- Advanced query formulation problems: involving multiple tables and grouping

Unit 3

- 2 modules
- ERD notation and examples
- Relationship representation
- Diagram rules

Unit 4

- 2 modules
- Data modeling guidelines and narrative problems
- Transformations for alternative designs
- Detecting design errors

Unit 5

- 2 modules
- Conversion rules for entity types, 1-M relationships, and M-N relationships
- Functional dependencies: anomalies in designs and FDs as constraints to reason about redundancy
- Normal forms: BCNF
- Normalization guidelines: place in design process and application of normalization

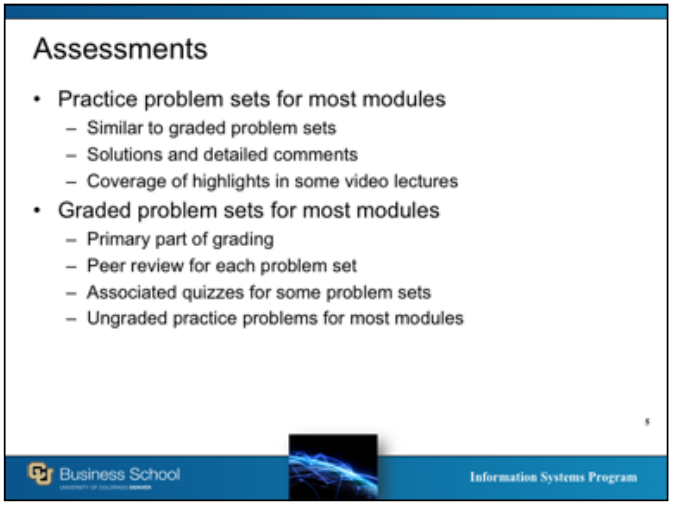
Assignments in all units

Short quizzes at the end of each unit

Threaded discussions in each unit

Final exam in unit 4

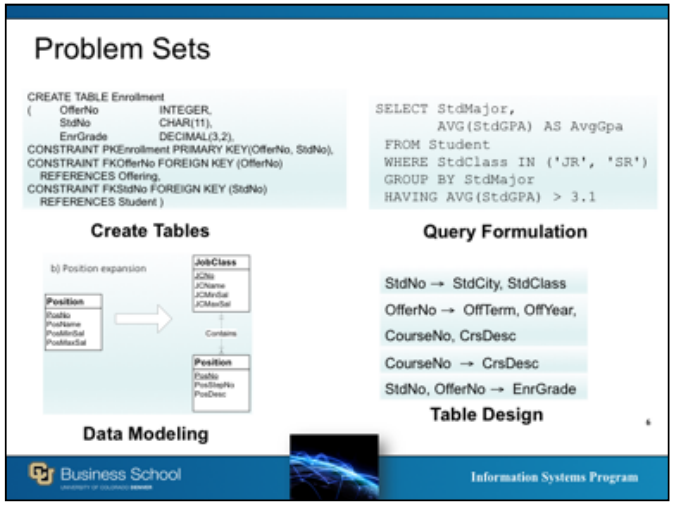





Since the course is problem and skill oriented, the major assessments will come from assignments.

Graded quizzes are closely connected to the course notes in lessons.

Ungraded practice problems are meant to be similar to assignment problems.




CREATE TABLE statements

- Tables
- Primary key and referential integrity constraints
- Populate with sample rows
- Oracle or MySQL

Query formulation

- Single table problems with a variety of conditions: numeric, text, logical operators
- Row summaries on single tables: grouping columns, aggregate functions, and group conditions
- Problems involving join operations on multiple tables
- Problems involving join operations and grouping
- Problems involving UNION operations

Data modeling problems

- 2 assignments: diagram symbols and rules; data modelling problems



- ERD usage and rules
- Identifying and resolving diagram errors
- Constructing ERDs from narrative statements about the problem
- Creating ERDs to be consistent with narrative problems

Table design

- Converting an ERD to a table design
- Identifying FDs
- Performing steps of BCNF using FDs

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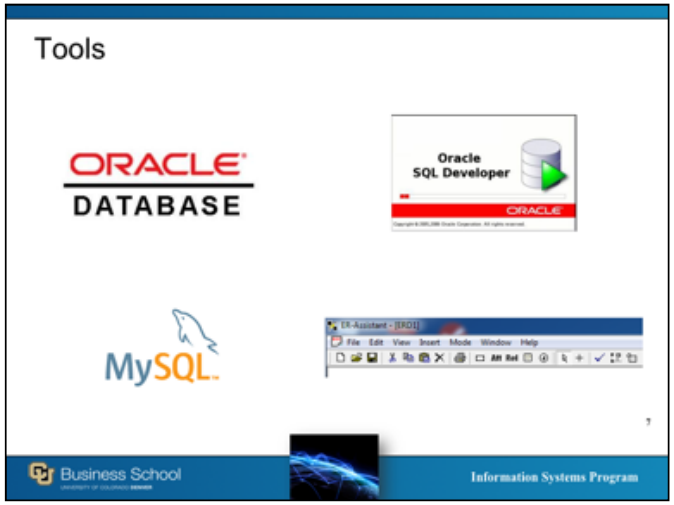
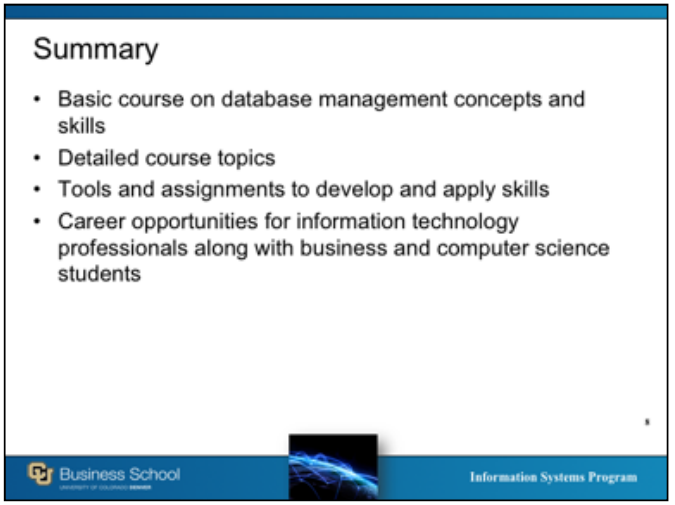



Use Oracle or MySQL for creating tables and query formulation

Use ER Assistant for data modeling

- Consistent with notation in the textbook and notes
- http://er-assistant.software.informer.com
- http://highered.mheducation.com/sites/0072942207/student_view0/e_r_assistant.html
- Other choices: most drawing tools, Visio Professional 2010, Aqua Data Studio






Basic course

- Subset of background provided in a complete database course
- Essential skills: query formulation, data modeling, and table design

Detailed course

-Query formulation

-Database development

-Important skills for computer analysts and business analysts

-Foundation skills for careers as database specialists

-Detailed skills: require lots of practice

-Not theoretical: no theorems will be presented or proven

Tools and assignments

- One assignment per week
- Use SQL and relational DBMS
- Perform data modeling and table design

Provide foundation for career opportunities in business intelligence working with or developing data warehouses