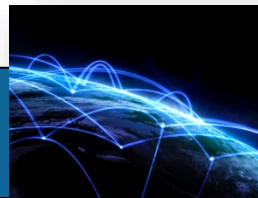# Database Management Essentials

Module 1: Course Introduction
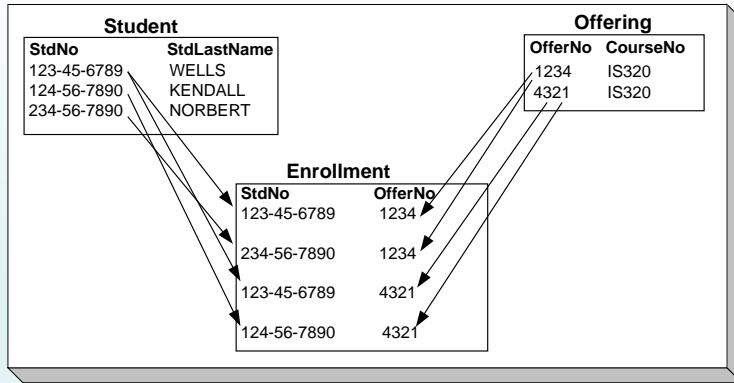
Lesson 2: Course Topics and Assignments
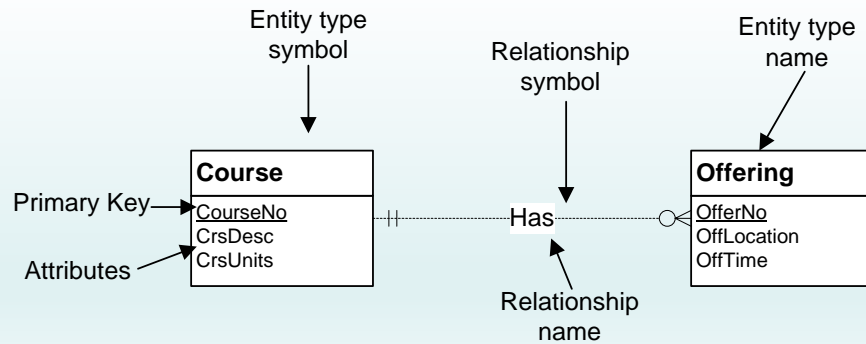
Lesson Objectives

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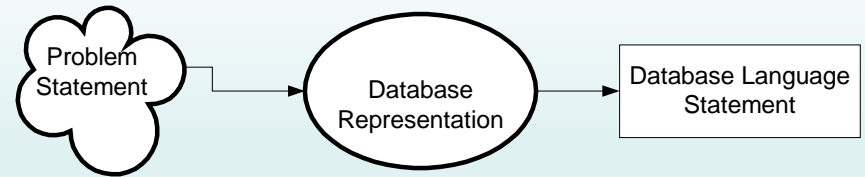- Obtain software

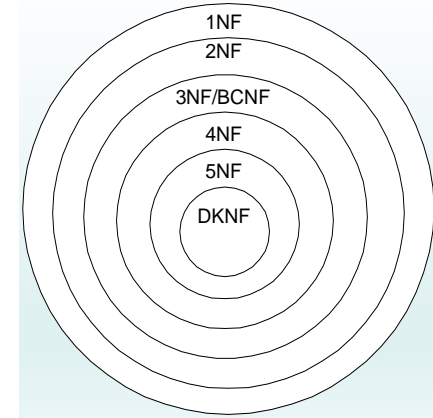# Course Topics

Integrity Rules

Query Formulation

Data Modeling

Table Design

Course Flow

Modules 1 to 3

- Course introduction
- Database characteristics
- DBMS features
- Processing environments
- Relational data model
- CREATE TABLE statement

Modules 4 and 5

- SELECT statement syntax
- Basic problems
- Guidelines
- Advanced problems

Modules 6 and 7

- Basic ERD notation
- Specialized relationships
- Diagram rules
- Detecting diagram errors

Modules 8 and 9

- Narrative problem analysis
- Transformations
- Detecting design errors
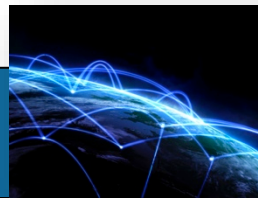
Modules 10 and 11

- Conversion rules
- FDs
- Normal forms
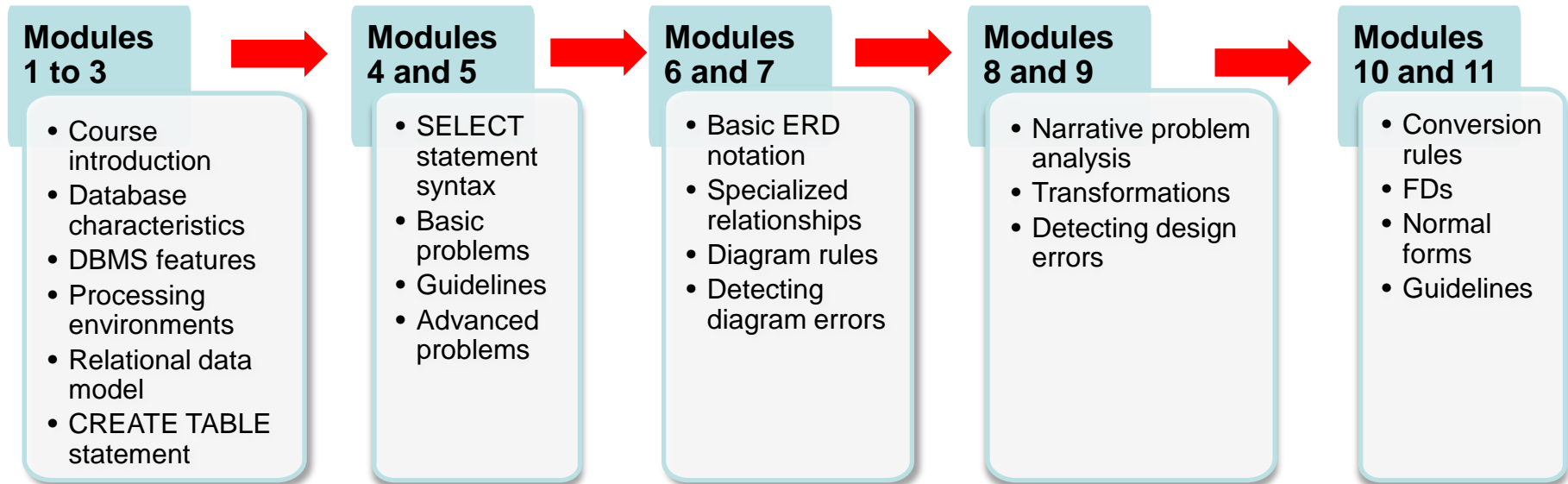- Guidelines

Honors Module 12

- Advanced matching problems for expert level skills
- Specialized but important business retrieval problems
  - Unmatched business entities: one-sided outer join operator
  - Asymmetric entity membership: relational difference operator
  - Entity subset matching: relational division operator
  - Nested summary computations
- Problem solving approach
  - Text patterns
  - SQL SELECT statement patterns
  - Additional syntax of the SQL SELECT statement
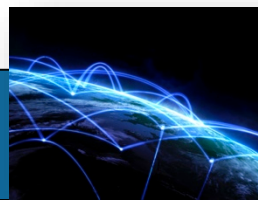
Assessments

- Practice problem sets for most modules
  - Like graded problem sets
  - Solutions and detailed comments
  - Coverage of highlights in some video lectures and slides
  - Associated quiz for some problem sets
- Graded problem sets for most modules
  - Self-evaluation review for each problem set
  - Associated quizzes for some problem sets
  - Encouraged to correct errors based on assessment guidelines before viewing correct responses
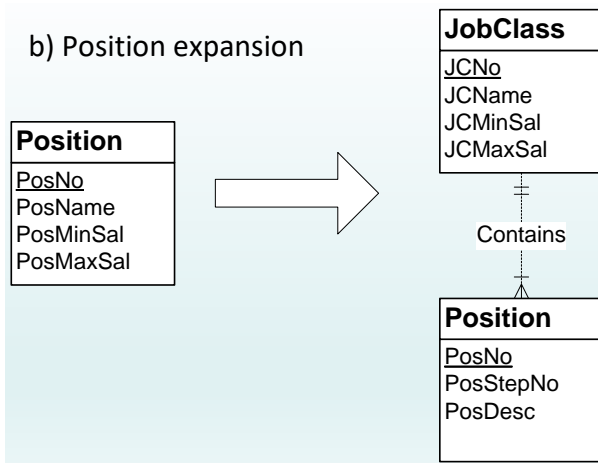
Problem Sets

```
CREATE TABLE Enrollment
(      OfferNo            INTEGER,
       StdNo              CHAR(11),
       EnrGrade           DECIMAL(3,2),
CONSTRAINT PKEnrollment PRIMARY KEY(OfferNo, StdNo),
CONSTRAINT FKOfferNo FOREIGN KEY (OfferNo)
   REFERENCES Offering,
CONSTRAINT FKStdNo FOREIGN KEY (StdNo)
   REFERENCES Student ) ;
```

Create Tables

```
SELECT StdMajor,
       AVG(StdGPA) AS AvgGpa
 FROM Student
 WHERE StdClass IN ('JR', 'SR')
 GROUP BY StdMajor
 HAVING AVG(StdGPA) > 3.1 ;
```

Query Formulation

b) Position expansion

JobClass
JCNo
JCName
JCMinSal
JCMaxSal

Position
PosNo
PosName
PosMinSal
PosMaxSal

Contains

Position
PosNo
PosStepNo
PosDesc

Data Modeling
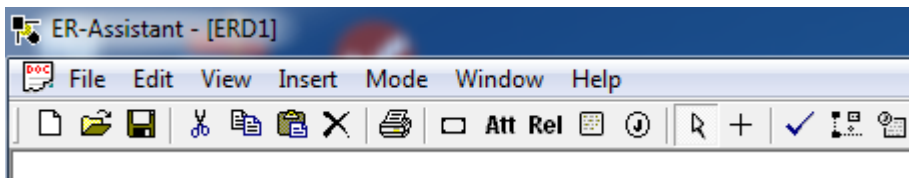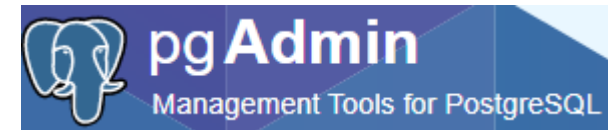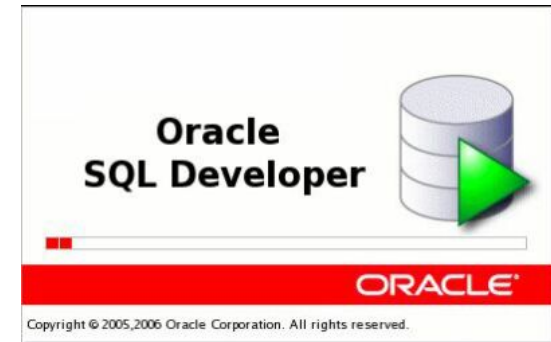
StdNo → StdCity, StdClass

OfferNo → OffTerm, OffYear,

CourseNo, CrsDesc

CourseNo → CrsDesc

StdNo, OfferNo → EnrGrade

Table Design

Tools

Summary

- Basic course on database management concepts and skills
- Detailed course topics
- Tools and assignments to develop and apply skills
- Career opportunities for information technology professionals along with business and computer science students