



# Module 4

## Basic Query Formulation with SQL

### Lesson 2: SELECT Statement Introduction



# Lesson Objectives

- Write SQL SELECT statements involving row conditions on single tables
- Execute SELECT statements
- Write and execute practice problems



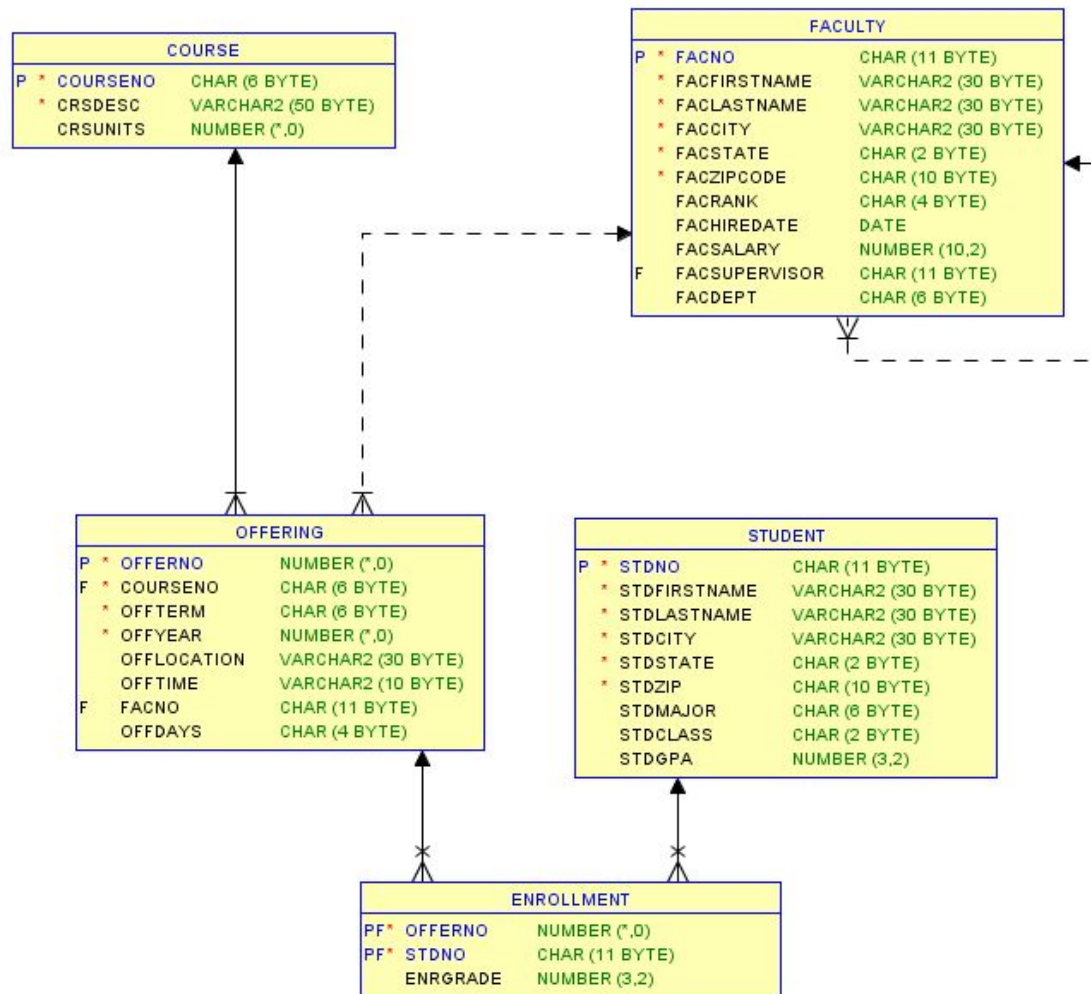
# SELECT Statement Overview

```
SELECT <list of column expressions>  
FROM <list of tables and join operations>  
WHERE <list of logical expressions for rows>  
ORDER BY <list of sorting specifications>
```

- Column expression: combination of columns, constants, operators, and functions
  - `FacSalary * 1.1`
- Logical expression: conditions connected by AND, OR, and NOT
  - `OffTerm = 'FALL' AND OffYear = 2016`



# University Database Diagram



# First SELECT Examples

## Example 1

```
SELECT * FROM Faculty;
```

## Example 2

```
SELECT *  
FROM Faculty  
WHERE FacNo = '543-21-0987';
```

## Example 3

```
SELECT FacFirstName, FacLastName, FacSalary  
FROM Faculty  
WHERE FacSalary > 65000 AND FacRank = 'PROF';
```

## Example 4

```
SELECT FacCity, FacState  
FROM Faculty;
```

```
SELECT DISTINCT FacCity, FacState  
FROM Faculty;
```



# Using Expressions

## Example 5 (Oracle)

```
SELECT FacFirstName, FacLastName, FacCity,  
       FacSalary*1.1 AS IncreasedSalary,  
       FacHireDate  
FROM Faculty  
WHERE to_number(to_char(FacHireDate, 'YYYY')) > 2005;
```

## Example 5 (MySQL)

```
SELECT FacFirstName, FacLastName, FacCity,  
       FacSalary*1.1 AS IncreasedSalary,  
       FacHireDate  
FROM Faculty  
WHERE (date_format(FacHireDate, '%Y')) > 2005;
```



# Inexact Text Matching

- Use LIKE operator to match against a pattern
- Use meta characters to specify patterns
  - Wildcard (%)
  - Any single character (\_)

## Example 6

```
SELECT *  
  FROM Offering  
 WHERE CourseNo LIKE 'IS%';
```





# Using Date Constants

- Dates are numbers
- Date constants and functions are not standard

## Example 7 (Oracle)

```
SELECT FacFirstName, FacLastName, FacHireDate
FROM Faculty
WHERE FacHireDate BETWEEN '1-Jan-2008'
AND '31-Dec-2009';
```

## Example 7 (MySQL)

```
SELECT FacFirstName, FacLastName, FacHireDate
FROM Faculty
WHERE FacHireDate BETWEEN '2008-01-01'
AND '2009-12-31';
```





# Combining Conditions

## Example 8: Testing for null values

```
SELECT OfferNo, CourseNo
FROM Offering
WHERE FacNo IS NULL AND OffTerm = 'SUMMER'
AND OffYear = 2017;
```

## Example 9: Mixing AND and OR

```
SELECT OfferNo, CourseNo, FacNo
FROM Offering
WHERE (OffTerm = 'FALL' AND OffYear = 2016)
OR (OffTerm = 'WINTER' AND OffYear = 2017);
```



# Summary

- Subset of the SELECT statement
- Background about database details essential for query formulation
- Lots of practice to master query formulation and SQL

