



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



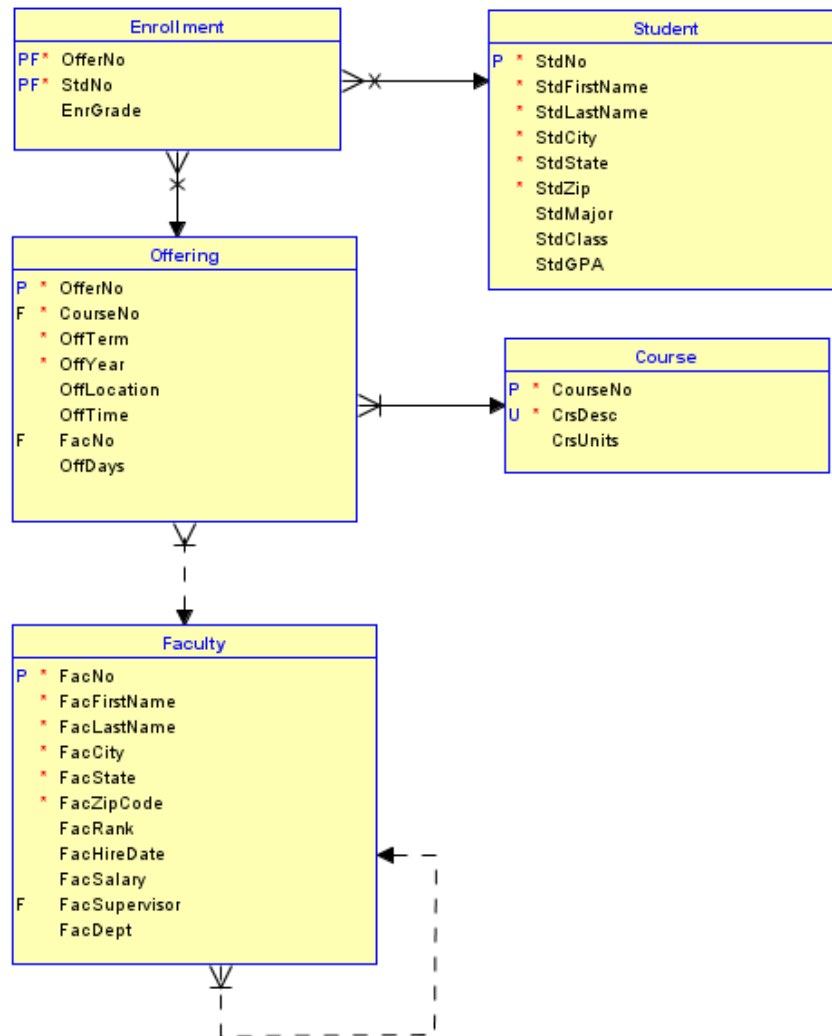
SELECT Statement Overview

```
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 = 2019`



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')) > 2008;
```

Example 5 (PostgreSQL)

```
SELECT FacFirstName, FacLastName, FacCity,  
       FacSalary*1.1 AS IncreasedSalary,  
       FacHireDate  
FROM Faculty  
WHERE (date_part('YEAR', FacHireDate)) > 2008;
```



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 and PostgreSQL)

```
SELECT FacFirstName, FacLastName, FacHireDate
FROM Faculty
WHERE FacHireDate BETWEEN '1-Jan-2011'
    AND '31-Dec-2012';
```

Example 7 (PostgreSQL)

```
SELECT FacFirstName, FacLastName, FacHireDate
FROM Faculty
WHERE FacHireDate BETWEEN '2011-01-01'
    AND '2012-12-31';
```



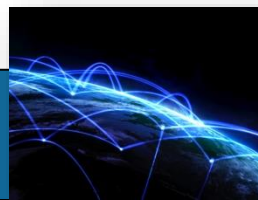
Combining Conditions

Example 8: Testing for null values

```
SELECT OfferNo, CourseNo
FROM Offering
WHERE FacNo IS NULL
      AND OffTerm = 'SUMMER'
      AND OffYear = 2020;
```

Example 9: Mixing AND and OR

```
SELECT OfferNo, CourseNo, FacNo
FROM Offering
WHERE (OffTerm = 'FALL' AND OffYear = 2019)
      OR (OffTerm = 'WINTER' AND OffYear = 2020);
```



Summary

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

