

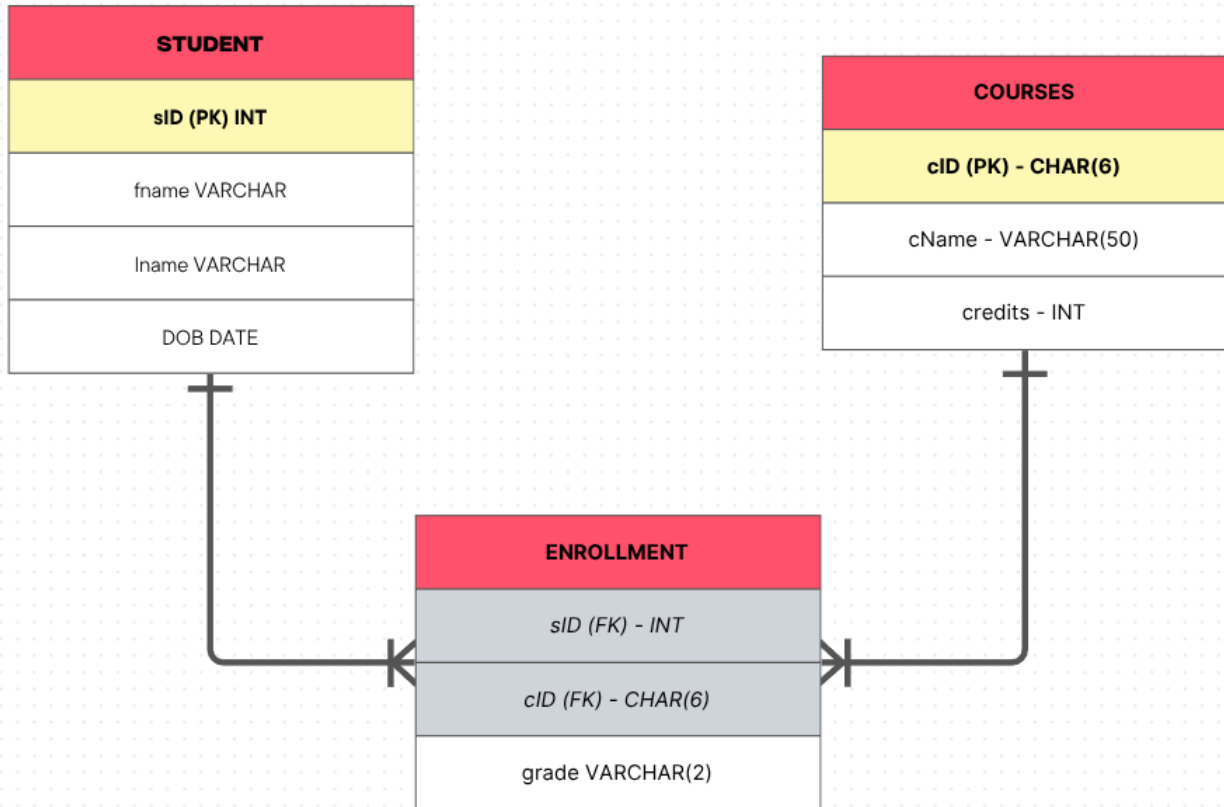
## SEN-209: Designing and Implementing Databases Lab 3: ERD & CRUD

Name: Thanawin Pattanaphol

ID: 01324096

Date: 9<sup>th</sup> September 2025

### ER Diagram



### SQL Queries

SQL Query	Output
<pre> CREATE DATABASE cmk1;  CREATE TABLE students (     sID INT PRIMARY KEY,     fname VARCHAR(20) NOT NULL,     lname VARCHAR(30) NOT NULL,     DOB DATE );  CREATE TABLE courses (     cID CHAR(6) PRIMARY KEY,     cName VARCHAR(50) NOT NULL,     credits INT );  CREATE TABLE enrollment (     sID INT REFERENCES students(sID),     cID CHAR(6) REFERENCES courses(cID),     grade VARCHAR(2),     PRIMARY KEY (sID, cID) );                 </pre>	<pre> postgres=# CREATE DATABASE test_university; CREATE DATABASE postgres=# \c test_university; You are now connected to database "test_university" as user "postgres". test_university=# CREATE TABLE students (     sID INT PRIMARY KEY,     fname VARCHAR(20) NOT NULL,     lname VARCHAR(30) NOT NULL,     DOB DATE ); test_university=# CREATE TABLE courses (     cID CHAR(6) PRIMARY KEY,     cName VARCHAR(50) NOT NULL,     credits INT ); test_university=# CREATE TABLE enrollment (     sID INT REFERENCES students(sID),     cID CHAR(6) REFERENCES courses(cID),     grade VARCHAR(2),     PRIMARY KEY (sID, cID) ); CREATE TABLE                 </pre>

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<p><b>Insert 3 students and 2 courses.</b></p> <pre> INSERT INTO students VALUES   (1000, 'Peter', 'Parker',    '2001-08-10'),   (1001, 'Miles', 'Morales',    '2001-08-03'),   (1002, 'Gwen', 'Stacy', '2001- 04-18');  INSERT INTO courses VALUES   ('2sf3Lf', 'Physics I', 5),   ('XjxDA6', 'Chemistry I', 6),   ('3lScza', 'Biology I', 4);  SELECT * FROM students;  SELECT * FROM courses; </pre>	<pre> test_university=# INSERT INTO students VALUES   (1000, 'Peter', 'Parker', '2001-08-10'),   (1001, 'Miles', 'Morales', '2001-08-03'),   (1002, 'Gwen', 'Stacy', '2001-04-18'); INSERT 0 3 test_university=# INSERT INTO courses VALUES   ('2sf3Lf', 'Physics I', 5),   ('XjxDA6', 'Chemistry I', 6); INSERT 0 2 test_university=# SELECT * FROM students;  sid   fname   lname   dob -----+-----+-----+-----  1000   Peter   Parker   2001-08-10  1001   Miles   Morales   2001-08-03  1002   Gwen   Stacy   2001-04-18 (3 rows)  test_university=# SELECT * FROM courses;  cid   cname   credits -----+-----+-----  2sf3Lf   Physics I   5  XjxDA6   Chemistry I   6 (2 rows) </pre>
<p><b>Enroll students into courses with grades.</b></p> <pre> INSERT INTO enrollment VALUES   (1000, 'XjxDA6', 'A'),   (1000, '2sf3Lf', 'A+'),   (1001, '2sf3Lf', 'B'),   (1002, 'XjxDA6', 'A'),   (1002, '2sf3Lf', 'A+');  SELECT * FROM enrollment; </pre>	<pre> test_university=# INSERT INTO enrollment VALUES   (1000, 'XjxDA6', 'A'),   (1000, '2sf3Lf', 'A+'),   (1001, '2sf3Lf', 'B'),   (1002, 'XjxDA6', 'A'),   (1002, '2sf3Lf', 'A+'); INSERT 0 5 test_university=# SELECT * FROM enrollment;  sid   cid   grade -----+-----+-----  1000   XjxDA6   A  1000   2sf3Lf   A+  1001   2sf3Lf   B  1002   XjxDA6   A  1002   2sf3Lf   A+ (5 rows) </pre>
<p><b>Retrieve all students with their enrolled courses.</b></p> <pre> SELECT   st.fname,   st.lname,   STRING_AGG   (     c.cName, ','   ) enrolled FROM students st INNER JOIN enrollment e ON e.sID = st.sID INNER JOIN courses c ON c.cID = e.cID GROUP BY st.fname, st.lname; </pre>	<pre> test_university=# SELECT   st.fname,   st.lname,   STRING_AGG   (     c.cName, ','   ) enrolled FROM students st INNER JOIN enrollment e ON e.sID = st.sID INNER JOIN courses c ON c.cID = e.cID GROUP BY st.fname, st.lname;  fname   lname   enrolled -----+-----+-----  Miles   Morales   Physics I  Peter   Parker   Chemistry I,Physics I  Gwen   Stacy   Chemistry I,Physics I (3 rows) </pre>

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Update one student's grade.

```
UPDATE enrollment
SET grade = 'A'
WHERE
    sID = 1001
AND
    cID = '2sf3Lf';

SELECT * FROM enrollment;
```

```
test_university=# UPDATE enrollment
SET grade = 'A'
WHERE
    sID = 1001
AND
    cID = '2sf3Lf';
UPDATE 1
test_university=# SELECT * FROM enrollment;
  sid | cid | grade
-----+-----+-----
 1000 | XjxDA6 | A
 1000 | 2sf3Lf | A+
 1002 | XjxDA6 | A
 1002 | 2sf3Lf | A+
 1001 | 2sf3Lf | A
(5 rows)
```

Delete one enrollment record.

```
SELECT * FROM enrollment;

DELETE FROM enrollment
WHERE
    sID = 1002
AND
    cID = 'XjxDA6';

SELECT * FROM enrollment;
```

```
test_university=# DELETE FROM enrollment
WHERE
    sID = 1002
AND
    cID = 'XjxDA6';
DELETE 1
test_university=# SELECT * FROM enrollment;
  sid | cid | grade
-----+-----+-----
 1000 | XjxDA6 | A
 1000 | 2sf3Lf | A+
 1002 | 2sf3Lf | A+
 1001 | 2sf3Lf | A
(4 rows)

test_university=# █
```