

Nama : Oktario Mufti Yudha

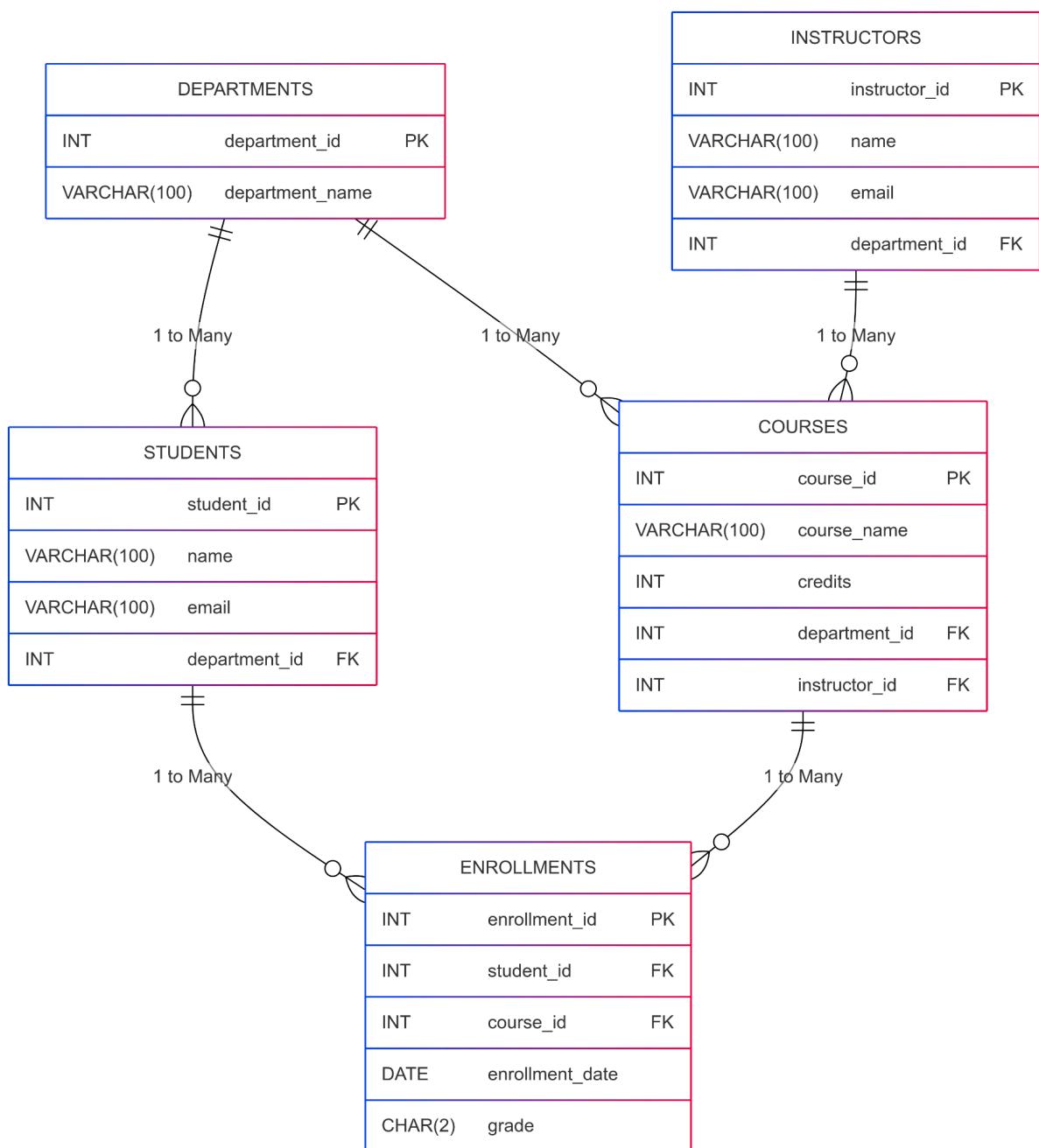
NPM : 2320506044

## 1. Studi Kasus dan Alasan Pemilihan

Studi Kasus: Sistem Informasi Akademik

Alasan: Sistem ini dipilih karena kompleksitasnya yang mencakup manajemen data mahasiswa, kursus, departemen, dan instruktur. Sistem ini memerlukan relasi yang jelas antar entitas, sehingga cocok untuk demonstrasi perancangan database.

## 2. Diagram ERD dan Deskripsi Entitas



### Deskripsi Entitas:

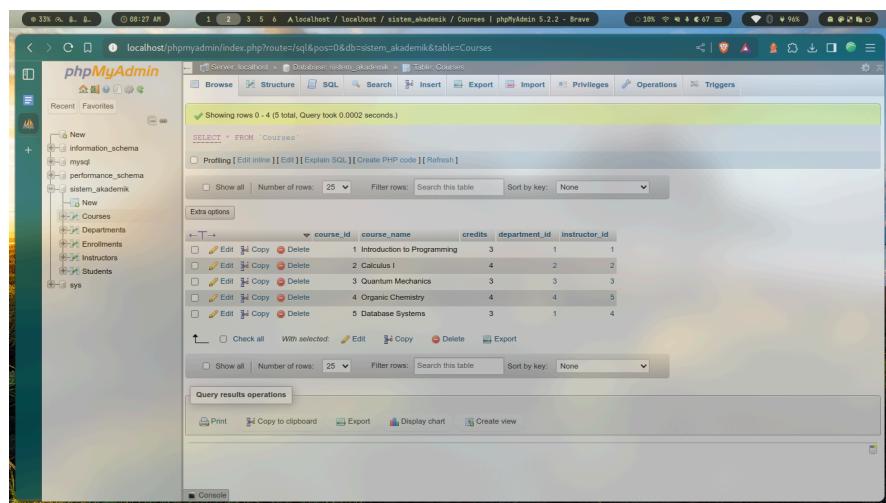
- Departments: Menyimpan data jurusan (department\_id, department\_name).
- Students: Menyimpan data mahasiswa (student\_id, name, email, department\_id).
- Instructors: Menyimpan data dosen (instructor\_id, name, email, department\_id).
- Courses: Menyimpan data kursus (course\_id, course\_name, credits, department\_id, instructor\_id).
- Enrollments: Menghubungkan mahasiswa dan kursus (enrollment\_id, student\_id, course\_id, enrollment\_date, grade).

### Relasi:

- Departments → Students (1:N): Satu jurusan memiliki banyak mahasiswa.
- Departments → Courses (1:N): Satu jurusan menawarkan banyak kursus.
- Instructors → Courses (1:N): Satu dosen mengajar banyak kursus.
- Students ↔ Courses (N:M): Relasi many-to-many melalui tabel Enrollments.

## 3. Implementasi di MySQL

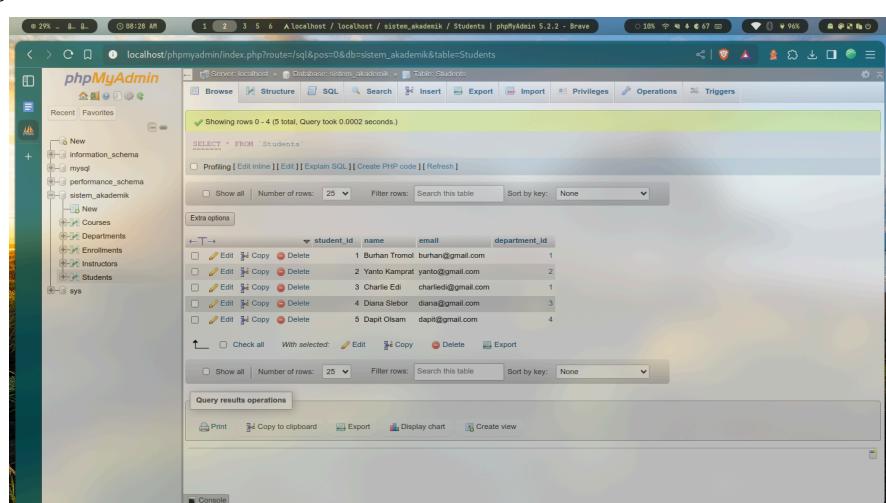
### Departements



The screenshot shows the phpMyAdmin interface for the 'Courses' table. The table structure is as follows:

course_id	course_name	credits	department_id	instructor_id
1	Introduction to Programming	3	1	1
2	Calculus I	4	2	2
3	Quantum Mechanics	3	3	3
4	Organic Chemistry	4	4	5
5	Database Systems	3	1	4

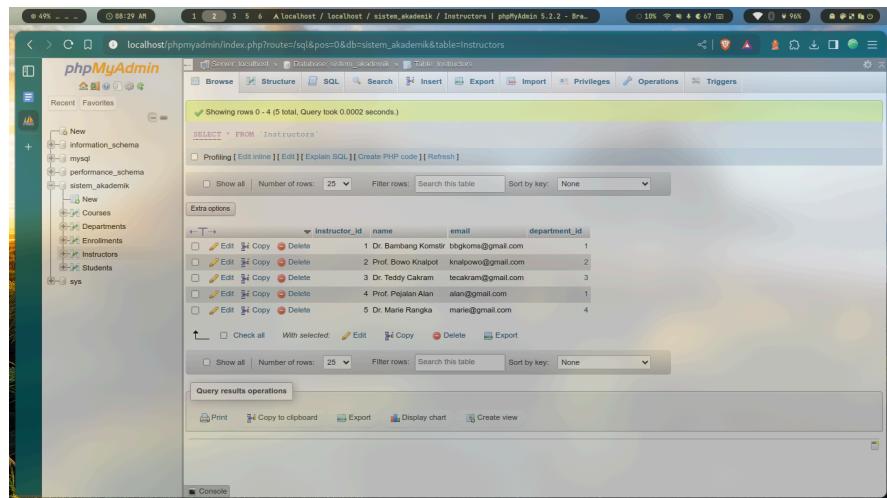
### Students



The screenshot shows the phpMyAdmin interface for the 'Students' table. The table structure is as follows:

student_id	name	email	department_id
1	Burhan Tromol	burhan@gmail.com	1
2	Yanto Kampot	yanto@gmail.com	2
3	Charlie Edi	chariledi@gmail.com	1
4	Diana Sibor	diana@gmail.com	3
5	Dapit Olsan	dapit@gmail.com	4

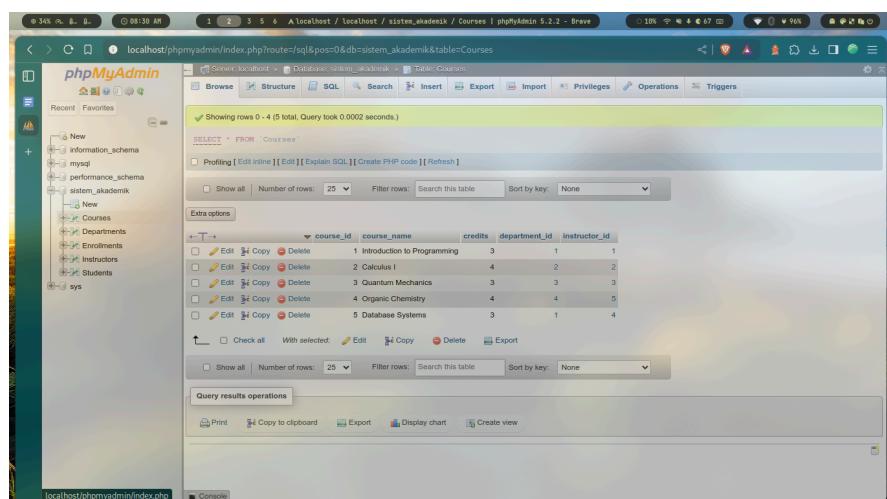
## Instructors



The screenshot shows the phpMyAdmin interface for the 'Instructors' table. The table has columns: instructor\_id, name, email, and department\_id. The data is as follows:

	instructor_id	name	email	department_id
1	1	Dr. Bambang Konsir	bbgkoms@gmail.com	1
2	2	Prof. Bowo Kinalit	knalitwog@gmail.com	2
3	3	Dr. Teddy Cakram	teckram@gmail.com	3
4	4	Prof. Pejalan Alan	alan@gmail.com	1
5	5	Dr. Marie Rangka	marie@gmail.com	4

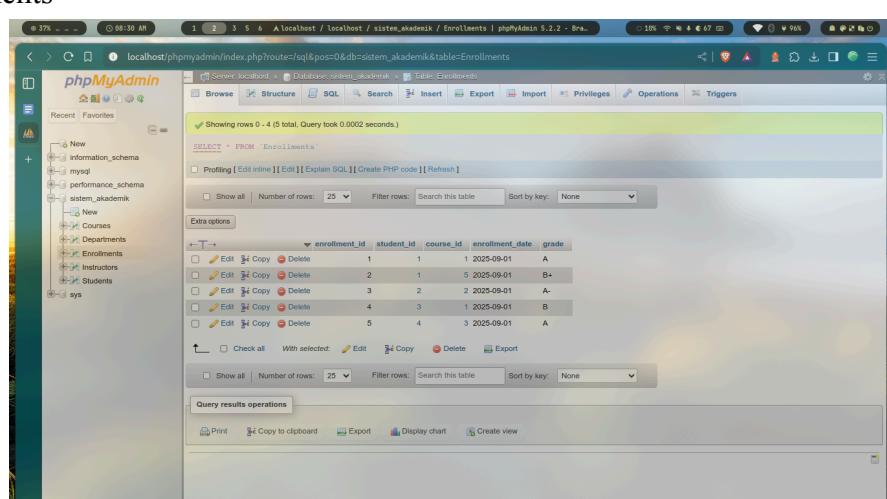
## Courses



The screenshot shows the phpMyAdmin interface for the 'Courses' table. The table has columns: course\_id, course\_name, credits, department\_id, and instructor\_id. The data is as follows:

	course_id	course_name	credits	department_id	instructor_id
1	1	Introduction to Programming	3	1	1
2	2	Calculus I	4	2	2
3	3	Quantum Mechanics	3	3	3
4	4	Organic Chemistry	4	4	5
5	5	Database Systems	3	1	4

## Enrollments

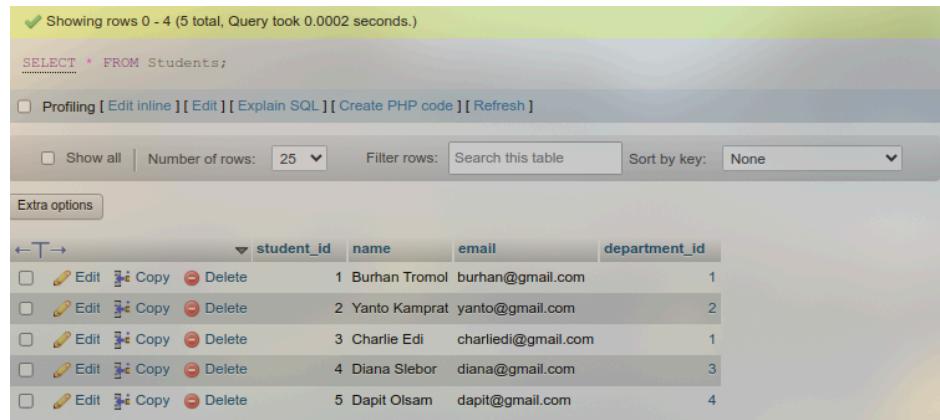


The screenshot shows the phpMyAdmin interface for the 'Enrollments' table. The table has columns: enrollment\_id, student\_id, course\_id, enrollment\_date, and grade. The data is as follows:

	enrollment_id	student_id	course_id	enrollment_date	grade
1	1	1	1	2025-09-01	A
2	2	1	5	2025-09-01	B+
3	3	2	2	2025-09-01	A-
4	4	3	1	2025-09-01	B
5	5	4	3	2025-09-01	A

## 4. Query SQL

- Menampilkan Seluruh Data Mahasiswa



Showing rows 0 - 4 (5 total, Query took 0.0002 seconds.)

```
SELECT * FROM Students;
```

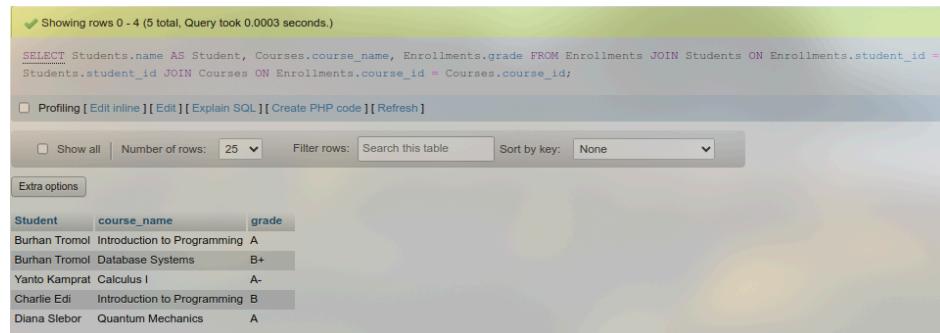
Profile [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

	student_id	name	email	department_id
<input type="checkbox"/>	1	Burhan Tromol	burhan@gmail.com	1
<input type="checkbox"/>	2	Yanto Kamprat	yanto@gmail.com	2
<input type="checkbox"/>	3	Charlie Edi	charliedi@gmail.com	1
<input type="checkbox"/>	4	Diana Slebor	diana@gmail.com	3
<input type="checkbox"/>	5	Dapit Olsam	dapit@gmail.com	4

- Join Tabel untuk Menampilkan Nilai Mahasiswa



Showing rows 0 - 4 (5 total, Query took 0.0003 seconds.)

```
SELECT Students.name AS Student, Courses.course_name, Enrollments.grade FROM Enrollments JOIN Students ON Enrollments.student_id = Students.student_id JOIN Courses ON Enrollments.course_id = Courses.course_id;
```

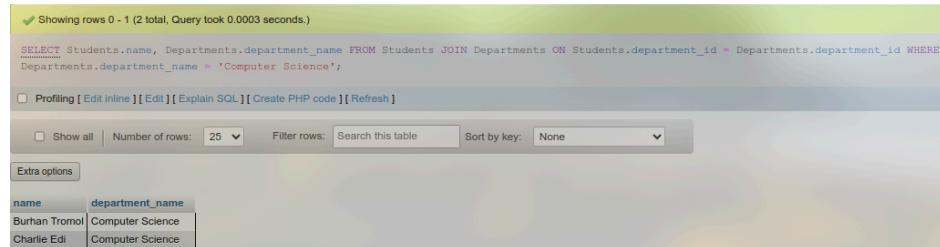
Profile [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

Student	course_name	grade
Burhan Tromol	Introduction to Programming	A
Burhan Tromol	Database Systems	B+
Yanto Kamprat	Calculus I	A-
Charlie Edi	Introduction to Programming	B
Diana Slebor	Quantum Mechanics	A

- Filter Mahasiswa dari Jurusan Computer Science



Showing rows 0 - 1 (2 total, Query took 0.0003 seconds.)

```
SELECT Students.name, Departments.department_name FROM Students JOIN Departments ON Students.department_id = Departments.department_id WHERE Departments.department_name = 'Computer Science';
```

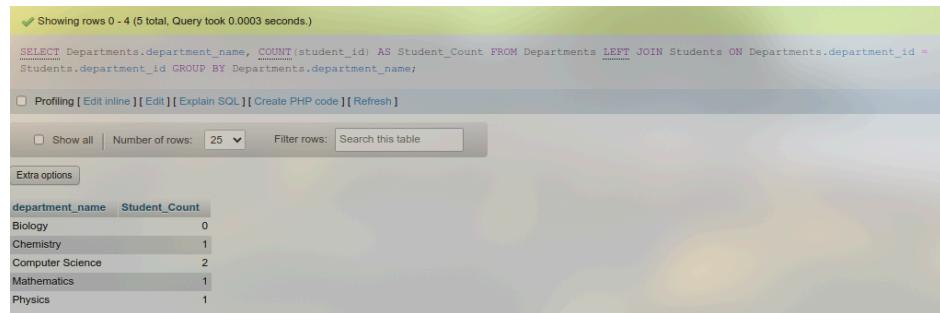
Profile [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

name	department_name
Burhan Tromol	Computer Science
Charlie Edi	Computer Science

- Hitung Jumlah Mahasiswa per Jurusan



Showing rows 0 - 4 (5 total, Query took 0.0003 seconds.)

```
SELECT Departments.department_name, COUNT(student_id) AS Student_Count FROM Departments LEFT JOIN Students ON Departments.department_id = Students.department_id GROUP BY Departments.department_name;
```

Profile [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

department_name	Student_Count
Biology	0
Chemistry	1
Computer Science	2
Mathematics	1
Physics	1