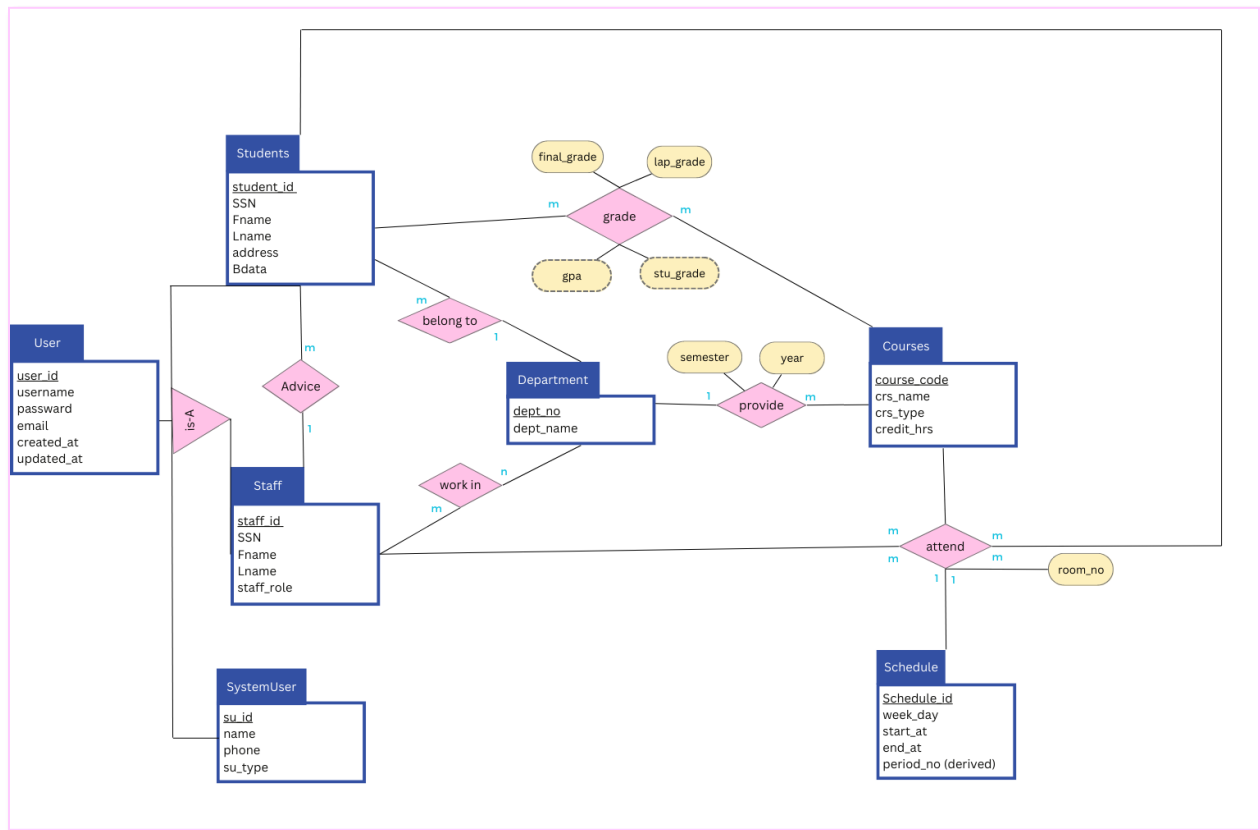# The database is for Ibn_Alhaitham website:

Main ideas of the database

- The login page with different type of users:
  - System user , Staff (e.g., professors , TA) , Students
- The faculty consists of 6 departments. Each student belongs to one but staff can work in more than one department.
- Each department provides many courses in specific semester.
- The students attend courses. Which will be given by the staff in specific schedule.
- Each student has advisor.
- The course can be lecture , lab, or tutorial.
- The grades are divided into final exam marks and lab or tutorial marks.

The ER diagram:

Note: in this design the entity and its attributed is represented by table to be clear

The Schema:

User(<u>user_id</u>, username, passward, email, created_at, updated_at)

Students(user_id "fk", <u>stu_id</u> , SSN, Fname,Lname, address ,Bdate, enrollment_date , Advisor "fk", dept_no 'fk')

Staff(user_id 'fk' , <u>staff_id</u>, SSN, Fname, Lname, staff_role)

SystemUser(user_id 'fk' ,<u>su_id</u> ,name,phone, su_type)

Departments(<u>dept_no</u>,dept_name)

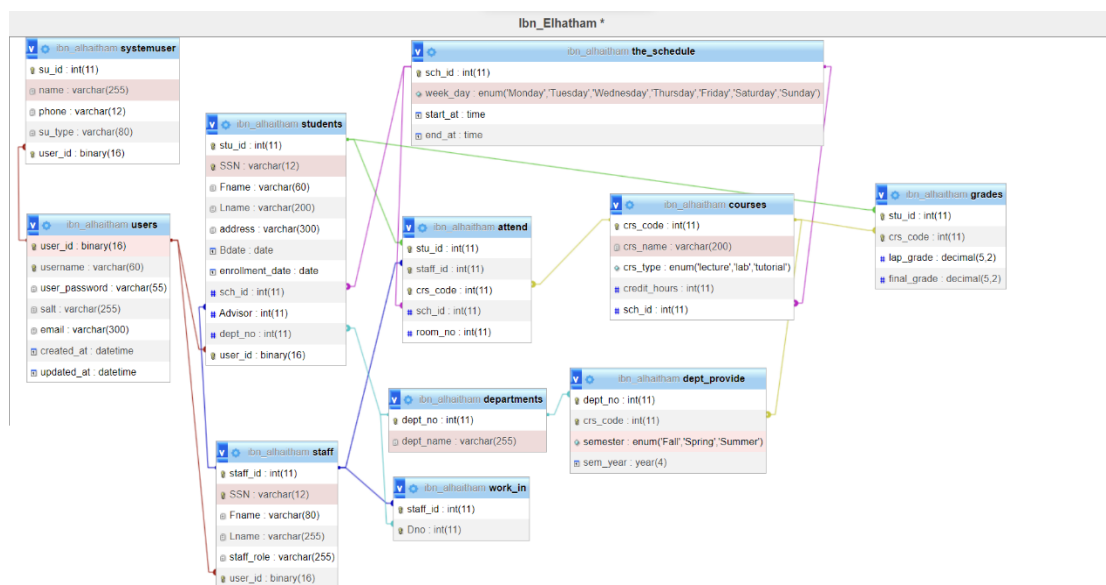Courses(<u>crs_code</u>, crs_name, crs_type, credit_hours,)

Schedule(<u>sch_id</u> , week_day , start_at,end_at)

attend(<u>stu_id 'fk' , crs_code 'fk'</u>, sch_id, <u>staff_id</u>,room_no)

work_in(<u>staff_id "fk",Dno "fk"</u>)

dept_provide(<u>dept_no 'fk' , crs_code 'fk'</u> , semester , year)

Grade(<u>stu_id 'fk' , crs_code'fk'</u>, lap_grade, final_grade)

The SQL code:

➢ DDL: creating the database structure

```sql
CREATE DATABASE Ibn_Alhaitham;

CREATE TABLE Users (
    user_id BINARY(16) DEFAULT UNHEX(REPLACE(UUID(),'-','')) PRIMARY KEY,
    username VARCHAR(60) NOT NULL UNIQUE,
    user_password VARCHAR(55) NOT NULL,
    salt VARCHAR(255) NOT NULL,
    email VARCHAR(300),
    created_at DATETIME NOT NULL,
    updated_at DATETIME
);

CREATE TABLE SystemUser (
    su_id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(255) NOT NULL,
    phone VARCHAR(12),
    su_type VARCHAR(80) NOT NULL,
    user_id BINARY(16) NOT NULL UNIQUE,
    FOREIGN KEY (user_id) REFERENCES Users(user_id)
);

CREATE TABLE Departments (
    dept_no INT PRIMARY KEY,
    dept_name VARCHAR(255) NOT NULL
);

CREATE TABLE The_schedule (
    sch_id INT AUTO_INCREMENT PRIMARY KEY,
    week_day ENUM('Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday',
'Sunday')  NOT NULL,
    start_at TIME NOT NULL,
    end_at TIME NOT NULL
);

CREATE TABLE Staff (
    staff_id int AUTO_INCREMENT PRIMARY KEY,
    SSN VARCHAR(12) NOT NULL UNIQUE,
    Fname VARCHAR(80) NOT NULL,
    Lname VARCHAR(255) NOT NULL,
    staff_role VARCHAR(255) NOT NULL,
    user_id BINARY(16) NOT NULL UNIQUE,
    FOREIGN KEY (user_id) REFERENCES Users(user_id)
);
```

```sql
CREATE TABLE Students (
    stu_id int AUTO_INCREMENT PRIMARY KEY,
    SSN VARCHAR(12) NOT NULL UNIQUE,
    Fname VARCHAR(60) NOT NULL,
    Lname VARCHAR(200) NOT NULL,
    address VARCHAR(300),
    Bdate DATE,
    enrollment_date DATE NOT NULL,
    sch_id INT,
    Advisor INT,
    dept_no INT NOT NULL,
    user_id BINARY(16) NOT NULL UNIQUE,
    FOREIGN KEY (user_id) REFERENCES Users(user_id),
    FOREIGN KEY (sch_id)  REFERENCES The_schedule(sch_id),
    FOREIGN KEY (Advisor) REFERENCES Staff(staff_id),
    FOREIGN KEY (dept_no) REFERENCES Departments(dept_no)
);

CREATE TABLE Courses (
    crs_code int AUTO_INCREMENT PRIMARY KEY,
    crs_name VARCHAR(200) NOT NULL,
    crs_type ENUM('lecture', 'lab', 'tutorial') NOT NULL,
    credit_hours INT NOT NULL,
    sch_id INT NOT NULL,
    FOREIGN KEY (sch_id) REFERENCES The_schedule(sch_id)
);

CREATE TABLE dept_provide(
    dept_no INT NOT NULL,
    crs_code int NOT NULL,
    semester ENUM('Fall','Spring','Summer') NOT null ,
    sem_year YEAR NOT NULL,
    PRIMARY KEY (dept_no , crs_code),
    FOREIGN KEY (dept_no) REFERENCES Departments(dept_no),
    FOREIGN KEY (crs_code) REFERENCES Courses(crs_code)
);


CREATE TABLE attend (
    stu_id int NOT NULL,
    staff_id int ,
    crs_code int ,
    sch_id INT,
    room_no INT,
    PRIMARY KEY (stu_id, crs_code,staff_id),
    FOREIGN KEY (stu_id) REFERENCES Students(stu_id),
    FOREIGN KEY (staff_id) REFERENCES Staff(staff_id),
    FOREIGN KEY (crs_code) REFERENCES Courses(crs_code),
    FOREIGN KEY (sch_id) REFERENCES The_schedule(sch_id)
);
```

```sql
CREATE TABLE work_in (
    staff_id int ,
    Dno INT ,
    PRIMARY KEY (staff_id, Dno),
    FOREIGN KEY (staff_id) REFERENCES Staff(staff_id),
    FOREIGN KEY (Dno) REFERENCES Departments(dept_no)
);


CREATE TABLE grades(
    stu_id int NOT NULL,
    crs_code int NOT NULL,
    lap_grade DECIMAL(5,2) ,
    final_grade DECIMAL(5,2),
    PRIMARY KEY (stu_id , crs_code),
    FOREIGN KEY (stu_id) REFERENCES Students(stu_id),
    FOREIGN KEY (crs_code) REFERENCES Courses(crs_code)
);
```

> ➢ DML: inserting data in the tables

```sql
INSERT INTO users (username, user_password ,created_at)
VALUES ("Ahmed",'A19964', NOW()), ("Mohamed",'m19974', NOW()),
("stu1",'s111', NOW()),
("stu2",'s112', NOW()),
("stu3",'s113', NOW()),
("staff1",'staff211', NOW()),
("staff2",'staff212', NOW());
```

	user_id	username	user_password	salt	email	created_at	updated_at
☐ ✏ Edit ⌗ Copy ⊖ Delete	0x63207dd1e84c11edbd071b481593a16d	Ahmed	A19964		NULL	2023-05-01 21:17:09	NULL
☐ ✏ Edit ⌗ Copy ⊖ Delete	0xc31ed923e84c11edbd071b481593a16d	Mohamed	m19974		NULL	2023-05-01 21:19:50	NULL
☐ ✏ Edit ⌗ Copy ⊖ Delete	0xc31eeb6be84c11edbd071b481593a16d	stu1	s111		NULL	2023-05-01 21:19:50	NULL
☐ ✏ Edit ⌗ Copy ⊖ Delete	0xc31eec20e84c11edbd071b481593a16d	stu2	s112		NULL	2023-05-01 21:19:50	NULL
☐ ✏ Edit ⌗ Copy ⊖ Delete	0xc31eec8ae84c11edbd071b481593a16d	stu3	s113		NULL	2023-05-01 21:19:50	NULL
☐ ✏ Edit ⌗ Copy ⊖ Delete	0xc31eece4e84c11edbd071b481593a16d	staff1	staff211		NULL	2023-05-01 21:19:50	NULL
☐ ✏ Edit ⌗ Copy ⊖ Delete	0xc31eedb7e84c11edbd071b481593a16d	staff2	staff212		NULL	2023-05-01 21:19:50	NULL

```sql
INSERT INTO systemuser (su_id, name, user_id,su_type)
VALUES
(001111111, 'Ahmed', (SELECT user_id FROM Users WHERE username = 'Ahmed') ,'Admin'),
(001111112, 'Mohamed', (SELECT user_id FROM Users WHERE username = 'Mohamed')
,'Admin');
```

	su_id	name	phone	su_type	user_id
☐ ✏ Edit ⌗ Copy ⊖ Delete	1111111	Ahmed	NULL	Admin	0x63207dd1e84c11edbd071b481593a16d
☐ ✏ Edit ⌗ Copy ⊖ Delete	1111112	Mohamed	NULL	Admin	0xc31ed923e84c11edbd071b481593a16d

```sql
INSERT Into departments (dept_no , dept_name)
VALUES (1 , 'Data Science'),
(2 , 'AI'),(3 , 'health care'),(4,'cyper security'),(5, 'business');
```

				dept_no	dept_name
☐	Edit	Copy	Delete	1	Data Science
☐	Edit	Copy	Delete	2	AI
☐	Edit	Copy	Delete	3	health care
☐	Edit	Copy	Delete	4	cyper security
☐	Edit	Copy	Delete	5	business

```sql
INSERT INTO Students (stu_id ,SSN, Fname, Lname, user_id, dept_no , enrollment_date)
VALUES
(2022111111,'123-45-6789', 'Afnan', 'Reda', (SELECT user_id FROM Users WHERE username
= 'stu1') , 1, DATE('2021-09-20')),
(2022111112,'223-45-6780', 'Basant', 'Ahmed', (SELECT user_id FROM Users WHERE
username = 'stu2') , 3, DATE('2022-09-15')),
(2022111113,'323-45-6781', 'Kenzy', 'Mohamed', (SELECT user_id FROM Users WHERE
username = 'stu3') , 4, DATE('2021-10-10'));
```

				stu_id	SSN	Fname	Lname	address	Bdate	enrollment_date	sch_id	Advisor	dept_no	user_id
☐	Edit	Copy	Delete	2022111111	123-45-6789	Afnan	Reda	NULL	NULL	2021-09-20	NULL	NULL	1	0xc31eeb6be84c11edbd071b481593a16d
☐	Edit	Copy	Delete	2022111112	223-45-6780	Basant	Ahmed	NULL	NULL	2022-09-15	NULL	NULL	3	0xc31eec20e84c11edbd071b481593a16d
☐	Edit	Copy	Delete	2022111113	323-45-6781	Kenzy	Mohamed	NULL	NULL	2021-10-10	NULL	NULL	4	0xc31eec8ae84c11edbd071b481593a16d

```sql
INSERT INTO users (username, user_password ,created_at) VALUES ("Ali",'a1997567',
NOW());

INSERT INTO staff (user_id , staff_id ,SSN, Fname , Lname, staff_role)
VALUES
((SELECT user_id FROM Users WHERE username = 'staff1'), 40441111 , '423-45-
6782','Hassan','Ahmed','professor'),
((SELECT user_id FROM Users WHERE username = 'staff2'), 50441111 , '523-45-
6783','Mona','Khaled','TA'),
((SELECT user_id FROM Users WHERE username = 'Ali'), 40441112 , '623-45-
6784','Ibrahem','Ali','professor');
```

				staff_id	SSN	Fname	Lname	staff_role	user_id
☐	Edit	Copy	Delete	40441111	423-45-6782	Hassan	Ahmed	professor	0xc31eece4e84c11edbd071b481593a16d
☐	Edit	Copy	Delete	40441112	623-45-6784	Ibrahem	Ali	professor	0xda902207e85011edbd071b481593a16d
☐	Edit	Copy	Delete	50441111	523-45-6783	Mona	Khaled	TA	0xc31eedb7e84c11edbd071b481593a16d

```sql
INSERT INTO The_Schedule (sch_id, start_at, end_at, week_day)
VALUES
    (1,'08:30:00','10:00:00', 'Monday'),
    (2,'10:00:00','12:30:00', 'Wednesday'),
    (3,'14:00:00','15:30:00', 'Wednesday');
```

				sch_id	week_day	start_at	end_at
☐	Edit	Copy	Delete	1	Monday	08:30:00	10:00:00
☐	Edit	Copy	Delete	2	Wednesday	10:00:00	12:30:00
☐	Edit	Copy	Delete	3	Wednesday	14:00:00	15:30:00

```sql
INSERT INTO Courses (credit_hours, crs_code, crs_name, crs_type, sch_id)
VALUES
    (3, 1101, 'Introduction to Computer Science', 'lecture', 1),
    (3, 1201, 'Data Structures and Algorithms', 'lab', 1),
    (3, 1202, 'Database Systems', 'tutorial', 2),
    (3, 1401, 'Operating Systems', 'lecture', 2),
    (3, 1501, 'Machine Learning', 'lecture', 3);
```

				crs_code	crs_name	crs_type	credit_hours	sch_id
☐	Edit	Copy	Delete	1101	Introduction to Computer Science	lecture	3	1
☐	Edit	Copy	Delete	1201	Data Structures and Algorithms	lab	3	1
☐	Edit	Copy	Delete	1202	Database Systems	tutorial	3	2
☐	Edit	Copy	Delete	1401	Operating Systems	lecture	3	2
☐	Edit	Copy	Delete	1501	Machine Learning	lecture	3	3

```sql
INSERT INTO Dept_Provide (crs_code, dept_no, semester, sem_year)
VALUES
    (1101, 1, 'Fall', 2022),
    (1201, 1, 'Fall', 2022),
    (1202, 2, 'Spring', 2023),
    (1401, 2, 'Spring', 2023),
    (1501, 3, 'Fall', 2022);
```

				dept_no	crs_code	semester	sem_year
☐	Edit	Copy	Delete	1	1101	Fall	2022
☐	Edit	Copy	Delete	1	1201	Fall	2022
☐	Edit	Copy	Delete	2	1202	Spring	2023
☐	Edit	Copy	Delete	2	1401	Spring	2023
☐	Edit	Copy	Delete	3	1501	Fall	2022

```sql
INSERT INTO Attend (crs_code, room_no, sch_id, staff_id, stu_id)
VALUES
    (1101, 304, 1, 40441111, 2022111111),
    (1101, 304, 1, 40441111, 2022111113),
    (1201, 306, 2, 50441111, 2022111111 ),
    (1401, 425, 1, 40441111, 2022111112);
```

				stu_id	staff_id	crs_code	sch_id	room_no
☐	Edit	Copy	Delete	2022111111	40441111	1101	1	304
☐	Edit	Copy	Delete	2022111111	50441111	1201	2	306
☐	Edit	Copy	Delete	2022111112	40441111	1401	1	425
☐	Edit	Copy	Delete	2022111113	40441111	1101	1	304

```sql
INSERT INTO work_in (Dno , staff_id)
VALUES (1,40441111),
(2,40441111),
(2,50441111),
(3,40441112);
```

				staff_id	Dno
☐	Edit	Copy	Delete	40441111	1
☐	Edit	Copy	Delete	40441111	2
☐	Edit	Copy	Delete	40441112	3
☐	Edit	Copy	Delete	50441111	2

```sql
INSERT INTO Grades (crs_code, final_grade, lap_grade, stu_id)
VALUES
    (1101, 75.5, 20.0, 2022111111),
    (1101, 55.0, 30.5, 2022111113),
    (1201, 72.5, NULL, 2022111111);
```

				stu_id	crs_code	lap_grade	final_grade
☐	Edit	Copy	Delete	2022111111	1101	20.00	75.50
☐	Edit	Copy	Delete	2022111111	1201	NULL	72.50
☐	Edit	Copy	Delete	2022111113	1101	30.50	55.00

The database link:

https://drive.google.com/file/d/12xdbchpZuOl3WHAsu4wSo9HdUJJEWHM_/view?usp=share_link