**Scema Design:**

**Create Database**

**CREATE DATABASE Institute\_Management\_System;**

**USE Institute\_Management\_System;**

**Create Users Table**

**CREATE TABLE Users (**

user\_id,

username,

password\_hash,

email,

role,

created\_at,

updated\_at,

is\_active

**);**

**Create Students Table**

**CREATE TABLE Students (**

student\_id,

user\_id,

name,

contact\_number,

address,

enrollment\_date,

updated\_at

**);**

**Create Faculty Table**

**CREATE TABLE Faculty (**

faculty\_id,

user\_id,

name,

contact\_number,

department,

updated\_at

**);**

**Create Courses Table**

**CREATE TABLE Courses (**

course\_id,

course\_code,

course\_name,

description,

credits,

faculty\_id,

semester,

year

**);**

**Create Student\_Courses Table**

**CREATE TABLE Student\_Courses (**

student\_course\_id,

student\_id,

course\_id,

enrollment\_date,

status

**);**

**Create Attendance Table**

**CREATE TABLE Attendance (**

attendance\_id,

student\_id,

course\_id,

date,

status,

remarks

**);**

**Create Grades Table**

**CREATE TABLE Grades (**

grade\_id,

student\_id,

course\_id,

grade,

remarks,

date\_assigned

**);**

**Create Examinations Table**

**CREATE TABLE Examinations (**

exam\_id,

course\_id,

exam\_date,

duration,

total\_marks,

exam\_type

**);**

**Create Fee\_Structure Table**

**CREATE TABLE Fee\_Structure (**

fee\_structure\_id,

fee\_type,

amount,

description

**);**

**Create Fee\_Payments Table**

**CREATE TABLE Fee\_Payments (**

payment\_id,

student\_id,

fee\_structure\_id,

payment\_date,

amount\_paid,

status,

payment\_method

**);**

**Create a Timetable Table**

**CREATE TABLE Timetable (**

timetable\_id,

course\_id,

faculty\_id,

room,

day,

start\_time,

end\_time

**);**

**Create Notifications Table**

**CREATE TABLE Notifications (**

notification\_id,

user\_id,

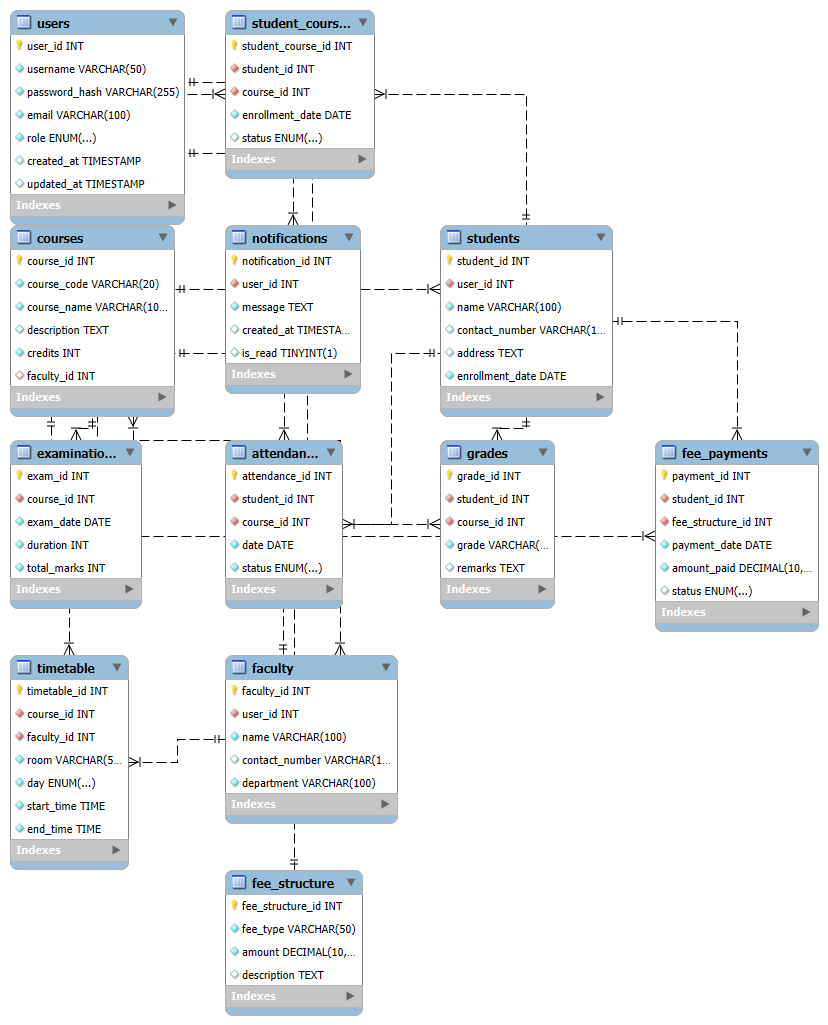
message,

created\_at,

expiry\_date,

is\_read

**);**

**E-R Diagram: **

**Normal Froms:**

**1st Normal Form (1NF)**

All tables are already in 1NF because:

* Each table has a primary key.
* All attributes are atomic.

**2nd Normal Form (2NF)**

No partial dependencies exist, so all tables are in 2NF. Below are the tables:

1. **Users**

| **user\_id** | **username** | **password\_hash** | **email** | **role** | **created\_at** | **updated\_at** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | admin01 | hashed\_password\_1 | [admin@example.com](mailto:admin@example.com) | admin | 2023-09-01 10:00:00 | 2023-09-01 10:00:00 |
| 2 | faculty01 | hashed\_password\_2 | [faculty@example.com](mailto:faculty@example.com) | faculty | 2023-09-01 10:00:00 | 2023-09-01 10:00:00 |
| 3 | student01 | hashed\_password\_3 | [student@example.com](mailto:student@example.com) | student | 2023-09-01 10:00:00 | 2023-09-01 10:00:00 |

1. **Students**

| **student\_id** | **user\_id** | **name** | **contact\_number** | **address** | **enrollment\_date** |
| --- | --- | --- | --- | --- | --- |
| 1 | 3 | John Doe | 1234567890 | 123 Street, City | 2023-09-01 |

1. **Faculty**

| **faculty\_id** | **user\_id** | **name** | **contact\_number** | **department** |
| --- | --- | --- | --- | --- |
| 1 | 2 | Dr. Smith | 0987654321 | Computer Science |

1. **Courses**

| **course\_id** | **course\_code** | **course\_name** | **description** | **credits** | **faculty\_id** |
| --- | --- | --- | --- | --- | --- |
| 1 | CS101 | Introduction to Programming | Basic programming concepts | 3 | 1 |
| 2 | CS102 | Data Structures | Fundamentals of data structures | 4 | 1 |

1. **Student\_Courses**

| **student\_course\_id** | **student\_id** | **course\_id** | **enrollment\_date** | **status** |
| --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 2023-09-05 | enrolled |

1. **Attendance**

| **attendance\_id** | **student\_id** | **course\_id** | **date** | **status** |
| --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 2023-09-06 | present |

1. **Grades**

| **grade\_id** | **student\_id** | **course\_id** | **grade** | **remarks** |
| --- | --- | --- | --- | --- |
| 1 | 1 | 1 | A | Excellent performance |

1. **Examinations**

| **exam\_id** | **course\_id** | **exam\_date** | **duration** | **total\_marks** |
| --- | --- | --- | --- | --- |
| 1 | 1 | 2023-12-01 | 120 | 100 |

1. **Fee\_Structure**

| **fee\_structure\_id** | **fee\_type** | **amount** | **description** |
| --- | --- | --- | --- |
| 1 | Tuition | 5000.00 | Semester tuition fee |
| 2 | Library | 500.00 | Library maintenance fee |

1. **Fee\_Payments**

| **payment\_id** | **student\_id** | **fee\_structure\_id** | **payment\_date** | **amount\_paid** | **status** |
| --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 2023-09-10 | 5000.00 | paid |

1. **Timetable**

| **timetable\_id** | **course\_id** | **faculty\_id** | **room** | **day** | **start\_time** | **end\_time** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | Room 101 | Monday | 09:00:00 | 10:30:00 |

1. **Notifications**

| **notification\_id** | **user\_id** | **message** | **created\_at** | **is\_read** |
| --- | --- | --- | --- | --- |
| 1 | 3 | Welcome to the Institute! | 2023-09-01 10:00:00 | FALSE |

**3rd Normal Form (3NF)**

All tables are already in 3NF since there are no transitive dependencies.

**Boyce-Codd Normal Form (BCNF)**

All tables are already in BCNF since there are no functional dependencies that violate the rules.