**LOW LEVEL DESIGN**

**Table: User (Base Class)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Key** | **Description** |
| id\_user | INT | PK, AI | Primary key |
| email | VARCHAR(100) | UNIQUE | Email used for login |
| username | VARCHAR(45) | UNIQUE | Username |
| password | VARCHAR(255) |  | Hashed password |
| role | ENUM('student', 'instructor', 'admin') |  | User role for access control |

**Table: Student (Inherits from User)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Key** | **Description** |
| id\_student | INT | PK, AI | Primary key |
| id\_user | INT | FK | References User(id\_user) |
| fname | VARCHAR(100) |  | First name |
| lname | VARCHAR(100) |  | Last name |
| studentID | VARCHAR(45) | UNIQUE | Official student number |

**Table: Instructor (Inherits from User)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Key** | **Description** |
| id\_instructor | INT | PK, AI | Primary key |
| id\_user | INT | FK | References User(id\_user) |
| fname | VARCHAR(100) |  | First name |
| lname | VARCHAR(100) |  | Last name |
| employeeID | VARCHAR(45) | UNIQUE | Official employee/instructor ID |

**Table: Course**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Key** | **Description** |
| id\_course | INT | PK, AI | Primary key |
| course\_code | VARCHAR(20) | UNIQUE | Course code (e.g., IT101) |
| course\_name | VARCHAR(100) |  | Descriptive course name |
| id\_instructor | INT | FK | References Instructor(id\_instructor) |

**Table: Enrollment**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Key** | **Description** |
| id\_enrollment | INT | PK, AI | Primary key |
| id\_student | INT | FK | References Student(id\_student) |
| id\_course | INT | FK | References Course(id\_course) |
| enrolled\_at | DATETIME |  | Date/time student enrolled |

**Table: Attendance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Key** | **Description** |
| id\_attendance | INT | PK, AI | Primary key |
| id\_student | INT | FK | References Student(id\_student) |
| id\_course | INT | FK | References Course(id\_course) |
| date | DATE |  | Date of attendance |
| status | ENUM('Present', 'Absent', 'Late') |  | Attendance status |

**Table: QRCode:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Key** | **Description** |
| id\_qr | INT | PK, AI | Primary key |
| id\_course | INT | FK | References Course(id\_course) |
| generated\_at | DATETIME |  | Date/time the QR code was created |
| qr\_data | TEXT |  | Encoded data for attendance |