1. STUDENT

Purpose: Stores information about registered students in the system.

Column Name	Data Type	Size	Constraint	Description
studentID	VARCHAR	20	PRIMARY KEY, NOT NULL	Unique student identifier (e.g., 2024-12345)
firstName	VARCHAR	50	NOT NULL	Student's first name
lastName	VARCHAR	50	NOT NULL	Student's last name
email	VARCHAR	100	UNIQUE, NOT NULL	Student's institutional email address
phoneNumber	VARCHAR	15	NULL	Student's contact number
course	VARCHAR	100	NOT NULL	Student's enrolled program/course
yearLevel	INT	-	CHECK (yearLevel BETWEEN 1 AND 5)	Current year level (1-5)
section	VARCHAR	20	NULL	Class section assignment
enrollmentStatus	ENUM	-	('Active', 'Inactive', 'Graduated', 'Dropped')	Current enrollment status
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
updatedAt	TIMESTAMP	-	NOT NULL	Last modification timestamp

Relationships:

1:1 with Face_Data (one student has one face record)
1:N with Attendance (one student has many attendance records)
1:N with Parent_Guardian (one student can have multiple guardians)

2. FACE_DATA

Purpose: Stores encrypted facial recognition data for students (weak entity - depends on Student).

Column Name	Data Type	Size	Constraint	Description
faceDataID	INT	-	PRIMARY KEY, AUTO_INCREMENT	Unique face data identifier
studentID	VARCHAR	20	FOREIGN KEY (Student), NOT NULL, UNIQUE	Reference to student
faceEncoding	LONGBLOB	-	NOT NULL	Encrypted facial feature embedding (binary)
captureDate	TIMESTAMP	-	NOT NULL	Date when facial data was captured
encryptionStatus	ENUM	-	('Encrypted', 'Pending', 'Failed')	Encryption status of facial data
isActive	BOOLEAN	-	NOT NULL	Whether this face data is currently active
expiryDate	DATE	-	NULL	Optional expiry date for facial data

Column Name	Data Type	Size	Constraint	Description
captureQuality	DECIMAL	5,2	CHECK (captureQuality BETWEEN 0 AND 100)	Quality score of captured image (0-100)
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
updatedAt	TIMESTAMP	-	NOT NULL	Last modification timestamp
Indexes:				
PRIMARY KEY: faceDataID				
UNIQUE: studentID				
INDEX: isActive				
Relationships:				
N:1 with Student (many face data records belong to one student - though enforced as 1:1 via UNIQUE)				
Security Notes:				
faceEncoding stored as encrypted binary (LONGBLOB)				
Data Privacy Act 2012 compliant				
Auto-deletion on student removal (CASCADE)				
3. TEACHER				
Purpose: Stores information about teachers who manage attendance records and courses.				
Column Name	Data Type	Size	Constraint	Description

Column Name	Data Type	Size	Constraint	Description
teacherID	VARCHAR	20	PRIMARY KEY, NOT NULL	Unique teacher identifier (e.g., TCH-001)
firstName	VARCHAR	50	NOT NULL	Teacher's first name
lastName	VARCHAR	50	NOT NULL	Teacher's last name
email	VARCHAR	100	UNIQUE, NOT NULL	Teacher's institutional email
department	VARCHAR	100	NOT NULL	Department/faculty affiliation
phoneNumber	VARCHAR	15	NULL	Teacher's contact number
isActive	BOOLEAN	-	NOT NULL	Whether teacher account is active
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
updatedAt	TIMESTAMP	-	NOT NULL	Last modification timestamp
Relationships:				
1:N with Course (one teacher teaches many courses)				
1:N with Report (one teacher generates many reports)				
4. COURSE				
Purpose: Stores course/subject information offered by the institution.				
Column Name	Data Type	Size	Constraint	Description

courseID	VARCHAR	20	PRIMARY KEY, NOT NULL	Unique course identifier (e.g., CS101)
courseName	VARCHAR	150	NOT NULL	Full course name
courseCode	VARCHAR	20	UNIQUE, NOT NULL	Course code abbreviation
description	TEXT	-	NULL	Course description
units	INT	-	CHECK (units BETWEEN 1 AND 6)	Credit units
teacherID	VARCHAR	20	FOREIGN KEY (Teacher), NOT NULL	Assigned teacher
schedule	VARCHAR	100	NULL	Class schedule (e.g., "MWF 10:00-11:00")
room	VARCHAR	50	NULL	Room/building assignment
semester	ENUM	-	('1st', '2nd', 'Summer')	Academic semester
schoolYear	VARCHAR	10	NOT NULL	Academic year (e.g., "2024-2025")
isActive	BOOLEAN	-	NOT NULL	Whether course is currently active
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
updatedAt	TIMESTAMP	-	NOT NULL	Last modification timestamp

Relationships:				
N:1 with Teacher (many courses belong to one teacher)				
1:N with Attendance (one course has many attendance sessions)				
5. ATTENDANCE				
Purpose: Records student attendance sessions (associative entity between Student and Course).				
Column Name	Data Type	Size	Constraint	Description
attendanceID	INT	-	PRIMARY KEY, AUTO_INCREMENT	Unique attendance record identifier
studentID	VARCHAR	20	FOREIGN KEY (Student), NOT NULL	Reference to student
courseID	VARCHAR	20	FOREIGN KEY (Course), NOT NULL	Reference to course
date	DATE	-	NOT NULL	Attendance date
timeIn	TIME	-	NULL	Time student entered
timeOut	TIME	-	NULL	Time student left
status	ENUM	-	('Present', 'Late', 'Absent', 'Excused')	Attendance status
verificationMethod	ENUM	-	('Facial Recognition', 'Manual', 'Override')	How attendance was recorded

			CHECK (confidence BETWEEN 0 AND 100)	AI confidence score (0-100)
confidence	DECIMAL	5,2		
remarks	TEXT	-	NULL	Additional notes or comments
recordedBy	VARCHAR	20	NULL	User ID who recorded/modified attendance
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
updatedAt	TIMESTAMP	-	NOT NULL	Last modification timestamp
Relationships:				
N:1 with Student (many attendance records belong to one student)				
N:1 with Course (many attendance records belong to one course)				
1:N with Notification (one attendance triggers notifications)				
N:1 with Report (many attendance records generate one report)				
Business Rules:				
One student can only have ONE attendance record per course per day				
Status defaults to 'Absent' unless facial recognition succeeds				
Confidence score required when verificationMethod = 'Facial Recognition'				
6. PARENT_GUARDIAN				
Purpose: Stores parent/guardian information for notification purposes.				

Column Name	Data Type	Size	Constraint	Description
parentID	INT	-	PRIMARY KEY, AUTO_INCREMENT	Unique parent/guardian identifier
studentID	VARCHAR	20	FOREIGN KEY (Student), NOT NULL	Reference to student
firstName	VARCHAR	50	NOT NULL	Parent's first name
lastName	VARCHAR	50	NOT NULL	Parent's last name
relationship	ENUM	-	('Father', 'Mother', 'Guardian', 'Other')	Relationship to student
contactNumber	VARCHAR	15	NOT NULL	Primary contact number for SMS
email	VARCHAR	100	NULL	Parent's email address
isActive	BOOLEAN	-	NOT NULL	Whether parent should receive notifications
preferredContact	ENUM	-	('SMS', 'Email', 'Both')	Preferred notification method
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
updatedAt	TIMESTAMP	-	NOT NULL	Last modification timestamp
Relationships:				
N:1 with Student (many parents can be guardians of one student)				

1:N with Notification (one parent receives many notifications)

7. NOTIFICATION

Purpose: Logs all notifications sent to parents/guardians (weak entity).

Column Name	Data Type	Size	Constraint	Description
notificationID	INT	-	PRIMARY KEY, AUTO_INCREMENT	Unique notification identifier
parentID	INT	-	FOREIGN KEY (Parent_Guardian), NOT NULL	Reference to parent
studentID	VARCHAR	20	FOREIGN KEY (Student), NOT NULL	Reference to student
message	TEXT	-	NOT NULL	Notification message content
sentDate	TIMESTAMP	-	NOT NULL	When notification was sent
deliveryStatus	ENUM	-	('Sent', 'Failed', 'Pending', 'Delivered')	Delivery status
notificationType	ENUM	-	('Attendance', 'Late', 'Absent', 'Alert')	Type of notification
deliveryMethod	ENUM	-	('SMS', 'Email', 'Push')	Method used to send notification
retryCount	INT	-	DEFAULT 0	Number of delivery retry attempts

deliveredAt	TIMESTAMP	-	NULL	Actual delivery timestamp
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
Indexes:				
Relationships:				
N:1 with Parent_Guardian (many notifications sent to one parent)				
N:1 with Student (many notifications about one student)				
N:1 with Attendance (triggered by attendance marking)				
Business Rules:				
Auto-generated when attendance is marked (via trigger)				
Retry up to 3 times if delivery fails				
Archive after 90 days				
8. ADMINISTRATOR				
Purpose: Stores system administrator accounts with elevated privileges.				
Column Name	Data Type	Size	Constraint	Description
adminID	INT	-	PRIMARY KEY, AUTO_INCREMENT	Unique administrator identifier

			UNIQUE, NOT	
username	VARCHAR	50	NULL	Login username
passwordHash	VARCHAR	255	NOT NULL	Hashed password (bcrypt/SHA-256)
email	VARCHAR	100	UNIQUE, NOT NULL	Administrator email
firstName	VARCHAR	50	NOT NULL	Administrator's first name
lastName	VARCHAR	50	NOT NULL	Administrator's last name
role	ENUM	-	('Super Admin', 'Admin', 'IT Support')	Administrator role level
lastLogin	TIMESTAMP	-	NULL	Last successful login timestamp
isActive	BOOLEAN	-	NOT NULL	Whether account is active
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
updatedAt	TIMESTAMP	-	NOT NULL	Last modification timestamp
Relationships:				
1:N with Report (one admin generates many reports)				
1:N with Audit_Log (one admin has many logged actions)				
Security Notes:				

Passwords stored as bcrypt hash (never plain text)				
Role-based access control (RBAC)				
Session timeout after 30 minutes inactivity				
9. REPORT				
Purpose: Stores generated attendance reports and metadata.				

Column Name	Data Type	Size	Constraint	Description
reportID	INT	-	PRIMARY KEY, AUTO_INCREMENT	Unique report identifier
generatedBy	VARCHAR	20	NOT NULL	User ID who generated report (Teacher/Admin)
generatedDate	TIMESTAMP	-	NOT NULL	Report generation timestamp
reportType	ENUM	-	('Daily', 'Weekly', 'Monthly', 'Custom', 'Summary')	Type of report
startDate	DATE	-	NOT NULL	Report period start date
endDate	DATE	-	NOT NULL	Report period end date
fileFormat	ENUM	-	('PDF', 'Excel', 'CSV')	Generated file format
filePath	VARCHAR	255	NULL	Storage path/URL of generated file
recordCount	INT	-	DEFAULT 0	Number of records in report

Column Name	Data Type	Size	Constraint	Description
status	ENUM	-	('Generated', 'Processing', 'Failed')	Report generation status
createdAt	TIMESTAMP	-	NOT NULL	Record creation timestamp
Relationships:				
N:1 with Teacher (many reports generated by one teacher)				
N:1 with Administrator (many reports generated by one admin)				
1:N with Attendance (one report contains many attendance records)				
10. AUDIT_LOG				
Purpose: Tracks all system activities for security and compliance (Security table).				
Column Name	Data Type	Size	Constraint	Description
logID	INT	-	PRIMARY KEY, AUTO_INCREMENT	Unique log entry identifier
userID	VARCHAR	20	NOT NULL	User who performed action
userType	ENUM	-	('Student', 'Teacher', 'Admin')	Type of user
action	VARCHAR	100	NOT NULL	Action performed
tableName	VARCHAR	50	NULL	Database table affected
recordID	VARCHAR	50	NULL	Affected record identifier

ipAddress	VARCHAR	45	NULL	IP address of request
timestamp	TIMESTAMP	-	NOT NULL	When action occurred
status	ENUM	-	('Success', 'Failed', 'Warning')	Action outcome
details	TEXT	-	NULL	Additional details in JSON format
Relationships:				
Monitors all tables (implicit relationships via triggers)				
Purpose & Compliance:				
Security: Tracks unauthorized access attempts				
Compliance: Philippine Data Privacy Act 2012 (RA 10173)				
Audit Trail: Who did what, when, where				
Debugging: Trace system issues				
Accountability: Prove data handling practices				
Data Retention:				
Retain for 2 years minimum				
Archive after 1 year				
Required for legal compliance				