UNIVERSITY COURSE REGISTRATION MANAGEMENT SYSTEM

GROUP MEMBERS

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DATABASE DESCRIPTION

The **University Course Registration Management System (UCRMS)** is designed to manage and streamline student course registration, instructor assignments, and academic scheduling within a university.
It provides a centralized system that ensures students can register for courses efficiently while maintaining proper prerequisites, preventing timetable conflicts, and enforcing seat capacities.

The database captures relationships among students, courses, instructors, departments, and prerequisites. It automates enrollment validation and helps instructors and students manage course information easily.

BUSINESS RULES

1. Student Rules

1. Each student is uniquely identified by a Student_ID.
2. A student can register for multiple courses within a semester.
3. A student's total registered credits must not exceed the university's defined semester credit limit (e.g., 18 credits).
4. A student cannot enroll in two courses or sections that occur at the same day and time.
5. A student must have completed all prerequisite courses before enrolling in an advanced course.
6. A student may add or drop courses before the official registration deadlines.
7. When a student drops a course, their enrollment status is automatically updated in the system.
8. The system maintains a complete academic record for each student, including all past enrollments and grades.

2. Course Rules

1. Each course is uniquely identified by a Course_ID and has a distinct Course_Code.
2. Every course belongs to one and only one Department.
3. A course record includes attributes such as Course_Name, Credit_Hours, Capacity, and Semester_Offered.
4. A course can have zero or more prerequisites.
5. Each course is taught by only one instructor per section per semester.
6. A course cannot enroll more students than its defined capacity.
7. The same course may be offered in multiple semesters or academic years.

3. Instructor Rules

1. Each instructor is uniquely identified by an Instructor_ID.
2. Every instructor is associated with exactly one Department.
3. An instructor can teach multiple courses or sections, provided that no time conflicts exist.
4. Instructors can view and manage only their assigned courses and enrolled student lists.
5. The Teaching table manages the relationship between instructors and sections they teach.

4. Department Rules

1. Each department is uniquely identified by a Department_ID and has a Department_Name.
2. A department can offer multiple courses and employ multiple instructors.
3. Departments are responsible for managing course offerings, faculty assignments, and academic schedules.
4. Each instructor must be linked to exactly one department.

5. Section Rules

1. Each course offering for a specific term is represented as a Section, uniquely identified by a Section_ID.
2. Each section is linked to one course, one assigned instructor, one classroom, and one time slot.
3. No two sections can share the same classroom at the same time slot.
4. Each section's capacity must not exceed the classroom's available seats.
5. The Teaching table connects instructors to the sections they are assigned to teach.

6. Enrollment Rules

1. Each enrollment record links one student to one section.
2. The Enrollment table records Student_ID, Section_ID, Grade, Enrollment_Date, and optional Comments.
3. A student cannot be enrolled in the same section more than once per semester.
4. Enrollment is only allowed if the course has available capacity and no schedule conflict.
5. If a student drops a course, their status is updated, and a waitlisted student (if any) may be automatically enrolled.
6. The system maintains a historical record of all enrollments and grades for transcript purposes.

7. Prerequisite Rules

1. Each prerequisite record defines a relationship between a Course and another Course that must be completed beforehand.
2. A course cannot be its own prerequisite.
3. Cyclic prerequisites (e.g., Course A → Course B → Course A) are not allowed.

4. Students must successfully complete all prerequisite courses before enrolling in the dependent course.
5. Prerequisite relationships ensure a logical academic progression for students.

8. Classroom Rules

1. Each classroom is uniquely identified by a Room_ID.
2. A classroom includes details such as Room_Number, Building, and Available_Seats.
3. A classroom can host multiple sections, but not at the same time slot.
4. The classroom capacity determines the maximum number of students for any section scheduled there.

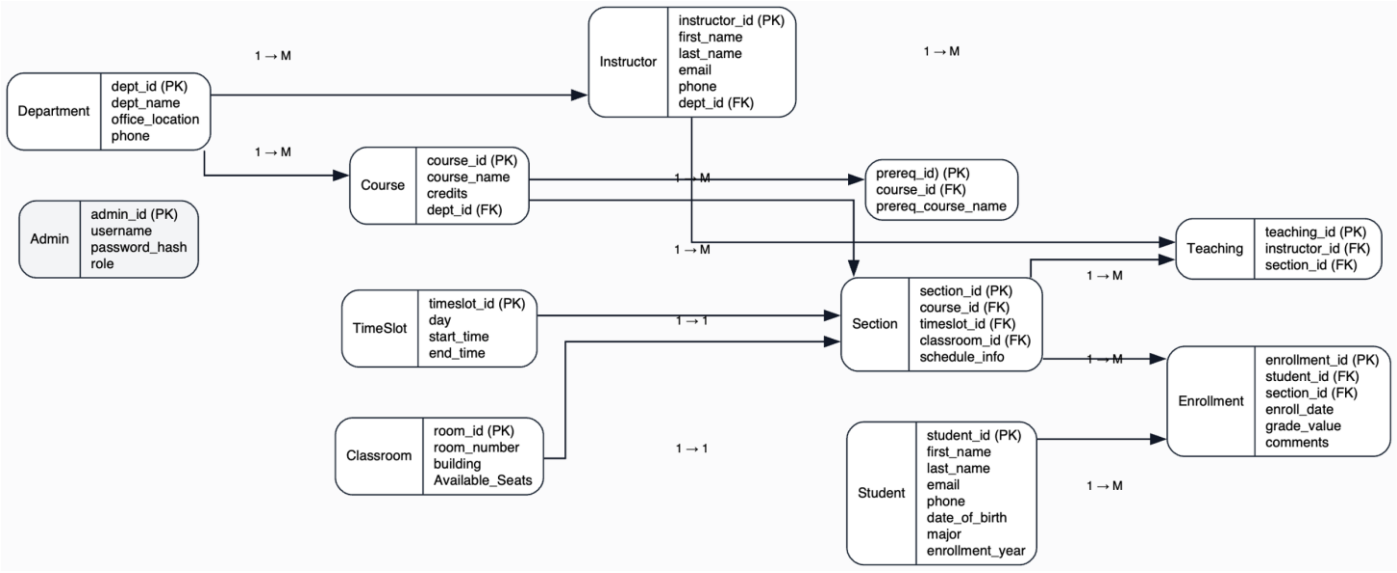
9. TimeSlot Rules

1. Each time slot is uniquely identified by a TimeSlot_ID.
2. A time slot specifies a Day, Start_Time, and End_Time.
3. No two sections can share the same classroom and time slot combination.
4. A single time slot can be reused across different courses if no scheduling conflict occurs.

10. Admin Rules

1. Each admin is uniquely identified by an Admin_ID.
2. Admins can have different roles (e.g., System Admin, Department Admin).
3. Admins are responsible for managing student records, faculty assignments, and system configurations.
4. Admin credentials are securely stored using password hashing.

E-R DIAGRAM



UNIVERSITY DATABASE DATA DICTIONARY

Table Name	AttributeName	Data Type	Description	Key Type
Admin	admin_id	INT	Unique identifier for each admin	PK
	username	VARCHAR(50)	Username for admin login	
	password_hash	VARCHAR(255)	Encrypted admin password	
	role	VARCHAR(30)	Admin's role (e.g., system, department)	
Department	dept_id	INT	Unique identifier for each department	PK
	dept_name	VARCHAR(100)	Name of the department	
	office_location	VARCHAR(100)	Office location of the department	
	phone	VARCHAR(15)	Department phone number	
Course	course_id	INT	Unique course identifier	PK
	course_name	VARCHAR(100)	Name of the course	
	credits	INT	Number of credits for the course	
	dept_id	INT	Department offering the course	FK
Prerequisite	prereq_id	INT	Unique identifier for each prerequisite	PK
	course_id	INT	Course requiring the prerequisite	FK
	prereq_course_id	INT	Course that serves as prerequisite	FK
Instructor	instructor_id	INT	Unique instructor ID	PK
	first_name	VARCHAR(50)	Instructor's first name	
	last_name	VARCHAR(50)	Instructor's last name	
	email	VARCHAR(100)	Instructor's email address	
	phone	VARCHAR(15)	Instructor's phone number	
	dept_id	INT	Department instructor belongs to	FK
Classroom	room_id	INT	Unique classroom ID	PK
	room_number	VARCHAR(10)	Room number	
	building	VARCHAR(50)	Building name	
	available_seats	INT	Number of seats available	
TimeSlot	timeslot_id	INT	Unique ID for each time slot	PK
	day	VARCHAR(15)	Day of the week	

	start_time	TIME	Start time of the slot	
	end_time	TIME	End time of the slot	
Section	section_id	INT	Unique section ID	PK
	course_id	INT	Course offered in this section	FK
	timeslot_id	INT	Time slot for the section	FK
	classroom_id	INT	Classroom assigned to section	FK
	schedule_info	VARCHAR(100)	Additional schedule details	
Teaching	teaching_id	INT	Unique ID for each teaching assignment	PK
	instructor_id	INT	Instructor assigned to section	FK
	section_id	INT	Section being taught	FK
	role	VARCHAR(50)	Role (e.g., Lecturer, TA)	
Student	student_id	INT	Unique student ID	PK
	first_name	VARCHAR(50)	Student's first name	
	last_name	VARCHAR(50)	Student's last name	
	email	VARCHAR(100)	Student's email address	
	phone	VARCHAR(15)	Student's phone number	
	date_of_birth	DATE	Student's date of birth	
	major	VARCHAR(100)	Student's declared major	
	enrollment_year	YEAR	Year student enrolled	
Enrollment	enrollment_id	INT	Unique enrollment ID	PK
	student_id	INT	Student enrolled	FK
	section_id	INT	Section enrolled in	FK
	enroll_date	DATE	Date of enrollment	
	grade_value	CHAR(2)	Grade received	
	comments	TEXT	Instructor's comments	

SAMPLE DATA

Table name: Department

Pk: Dept_id

Fk: Dept_id

Dept_id	Dept_name	Office_Location	Phone

CS_100	Computer Science	Room no 101	+1-800xxxxxx5
AI_200	Artificial Intelligence	Room no 110	+1-800xxxxxx7
DS_100	Data Science	Room no 107	+1-800xxxxxx6
CIS_200	Cyber Security	Room no 103	+1-800xxxxxx4
ML_300	Machine Learning	Room no 105	+1-800xxxxxx9

Table name: Course

PK: Course_id

Fk: dept_id,course_id

Course_id	Course_name	Credits	Dept_id
1001	Python Programming	3	CS_100
1003	Java	3	CS_100
1004	Data Preprocessing	3	DS_100
1005	Cloud Computing	3	CIS_200
1006	Deep Learning	3	DL_300
1007	Neural Networks	3	ML_300

Table name: Instructor

PK: Instructor_id

Fk: dept_id

Instructor_id	First_name	Last_name	Email	phone	Dept_id
SS11	Swathi	Shelvapulle	Swathi01@glu.edu	+1 6605805549	CS_100
CP12	Charan	Puppala	Puppala12@glu.edu	+1 6785432103	ML_300
JK13	Junaid	Khan	Khan123@glu.edu	+1 9843744115	CIS_200
PC14	Prabhath	Chowdary	Prabha143@glu.edu	+1 4796962441	DS_100

Table name: Student

PK: student_id

Fk: dept_id

Student_id	First_name	Last_name	Email	Phone	DOB	Major	Enroll_year
200201	Prabhas	Raju	pr1@glu.edu	+1 657XXXXXX2	09-21-1999	DS	2025
200221	Vijay	Antony	Va21@glu.edu	+1 689XXXXXX3	08-30-2000	DS	2025
200203	Williams	john	Wj3@glu.edu	+1 532XXXXXX7	01-02-1998	CIS	2024
200299	Sanjay	Dutt	Sd9@glu.edu	+1 609XXXXXX5	03-05-2001	ML	2024

Table name: Section

PK: Section_id

Fk: Course_id,Instructor_id,room_id

Section_id	Course_id	Instructor_id	Classsroom_id	Schedules_time
1A	1007	CP12	A251	8:30 A.M – 11:00 A.M
1B	1005	JK13	B251	12:10 P.M – 3:00 P.M
2A	1004	PC14	C251	8:30 A.M – 11:00 A.M

Table name: Classroom

PK: room_id

Fk:

Classroom_id	**Room_number**	**building**	**Available_seats**
A251	01	MIC BUILDING, LEES SUMMIT	30
B251	02	MIC BUILDING, LEES SUMMIT	30
C251	03	WARRENSBURG	30

Table name: Enrollment

PK: enrollment_id

Fk: student_id,section_id,

Enrollment_id	Student_id	Section_id	grade	enroll_date	Comments
01	200201	1A	A	07/20/2025	Excellent
02	200203	1A	B	07/20/2025	good
03	200201	2A	A	07/20/2025	Excellent
04	200299	1B	C	07/20/2025	Poor

Table name: Prerequisite

PK: prereq_id

Fk: course_id

Prereq_course_Id	**Prereq_Course_Name**	**Course_id**
Pr_05	**Object Oriented python**	1001
Pr_06	**C#**	1003
Pr_10	**R language**	1004
Pr_12	**Operating Systems**	1005
Pr_08	**Python Programming**	1006
Pr_11	**Introduction to AI**	1007

Table name: Admin

PK: admin_id

Admin_id	**username**	**Password_hash**	**role**

GLU01	Admin01	A********1	Administrator
GLU02	Admin02	A********2	Administrator

Table name: TimeSlot

PK: timeslot_id

Fk: course_id

Timeslot_id	Course_id	Day	Start_time	End_time
	1007	Wednesday	12:10 P.M	2:50 P.M
	1005	Friday	8:30 A.M	11:10 A.M
	1004	Friday	3:00 P.M	5:50 P.M

Table name: Teaching

PK: teaching_id

Fk: instructor_id,section_id

teaching_id	Instructor_id	Section_id
CRN100	CP12	1A
CRN200	JK13	1B
CRN300	PC14	2A