

ITI Examination System

(Database Documentation)

Track: Power BI Development

Branch: Tanta

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June 2025

Database Documentation

ITI Examination System

This document provides a comprehensive overview and detailed documentation for the ITI Examination System SQL Server database. It covers the database creation, configuration settings, table schemas, user-defined types, relationships, constraints, and stored procedures.

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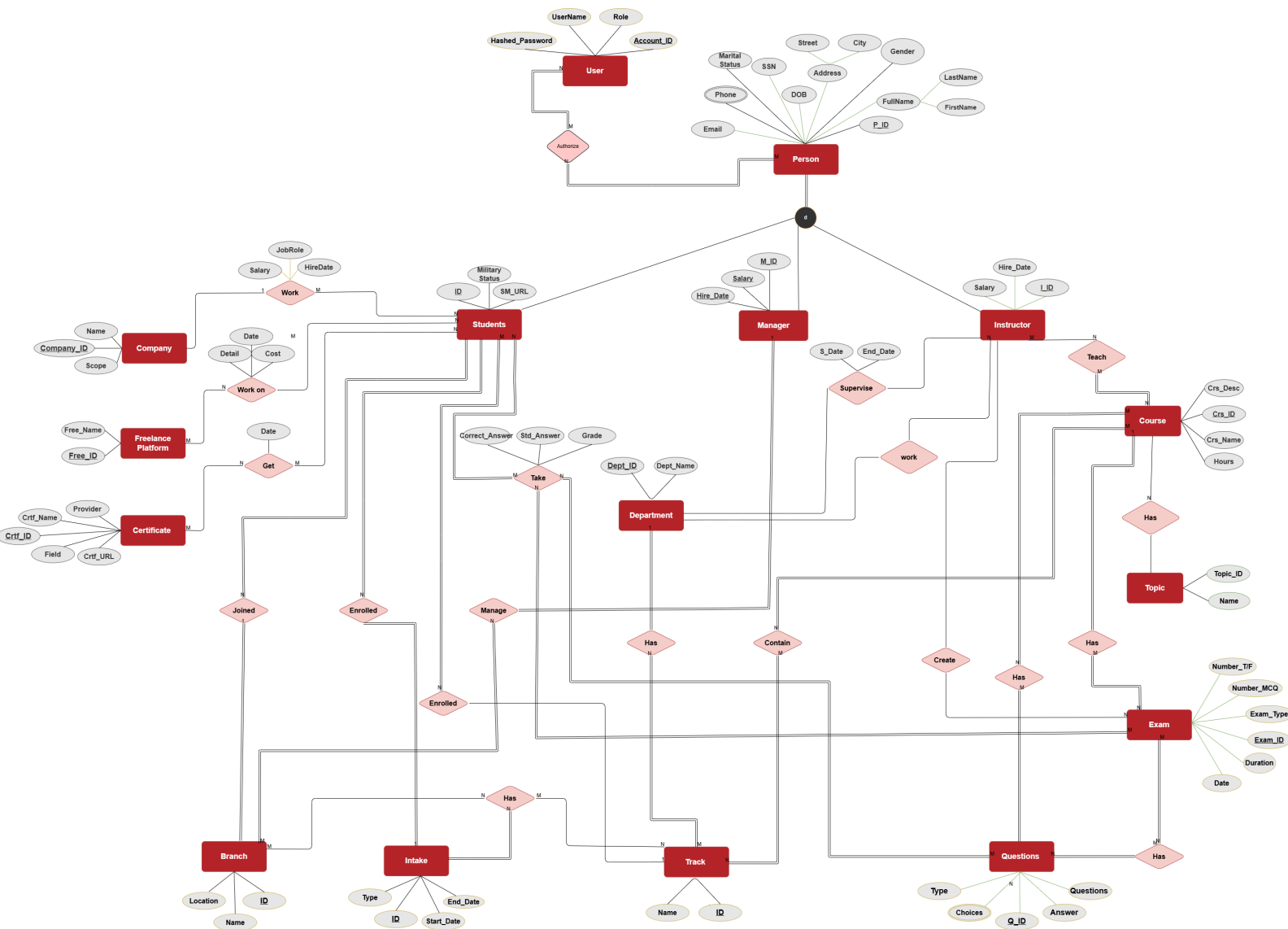
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ERD



Mapping

User			
Account_ID	Role	UserName	Hashed_Pass

User Person	
P_ID	Account_ID

Person									
P_ID	SSN	FName	LName	Email	DOB	Street	City	Gender	Marital_Status

Std_Phone	
P_ID	Phone

Manager		
Mng_ID	Hiring_Date	Salary

Student					
Std_ID	Marital_Status	SM_URL	Track_ID	Intake_ID	Branch_ID

Instructor			
Ins_ID	Hiring_Date	Salary	Dept_ID

Ins_Crs	
Crs_ID	Ins_ID

Department	
Dept_ID	Dept_Name

Course				
Crs_ID	Crs_Desc	Crs_Name	Hours	Topic_ID

Supervisor			
Dept_ID	Ins_ID	S_Date	End_Date

Topic	
Topic_ID	Name

Exam							
Exam_ID	Exam_Type	Qty_T/F	Qty_MCQ	Duration	Date	Crs_ID	Ins_ID

Questions			
Q_ID	Qst_Content	Type	Answer

Questions_Choices	
Q_ID	Choice

Crs_Qst	
Crs_ID	Q_ID

Track		
Track_ID	TrackName	Dept_ID

Track_Crs	
Track_ID	Crs_ID

Std_Exam_Qst				
Std_ID	ExamQst_ID	Std_Ans	Correct_Ans	Grade

Exam_Qst		
ExamQst_ID	Exam_ID	Q_ID

Intake			
Intake_ID	Type	Start_Date	End_Date

Branch			
Branch_ID	Branch_Name	Location	Mng_ID

Intake_Brch_Trk		
Intake_ID	Branch_ID	Track_ID

Company		
Company_ID	CompanyName	Scope

Std_Company				
Std_ID	Company_ID	Job_Role	Salary	Hire_Date

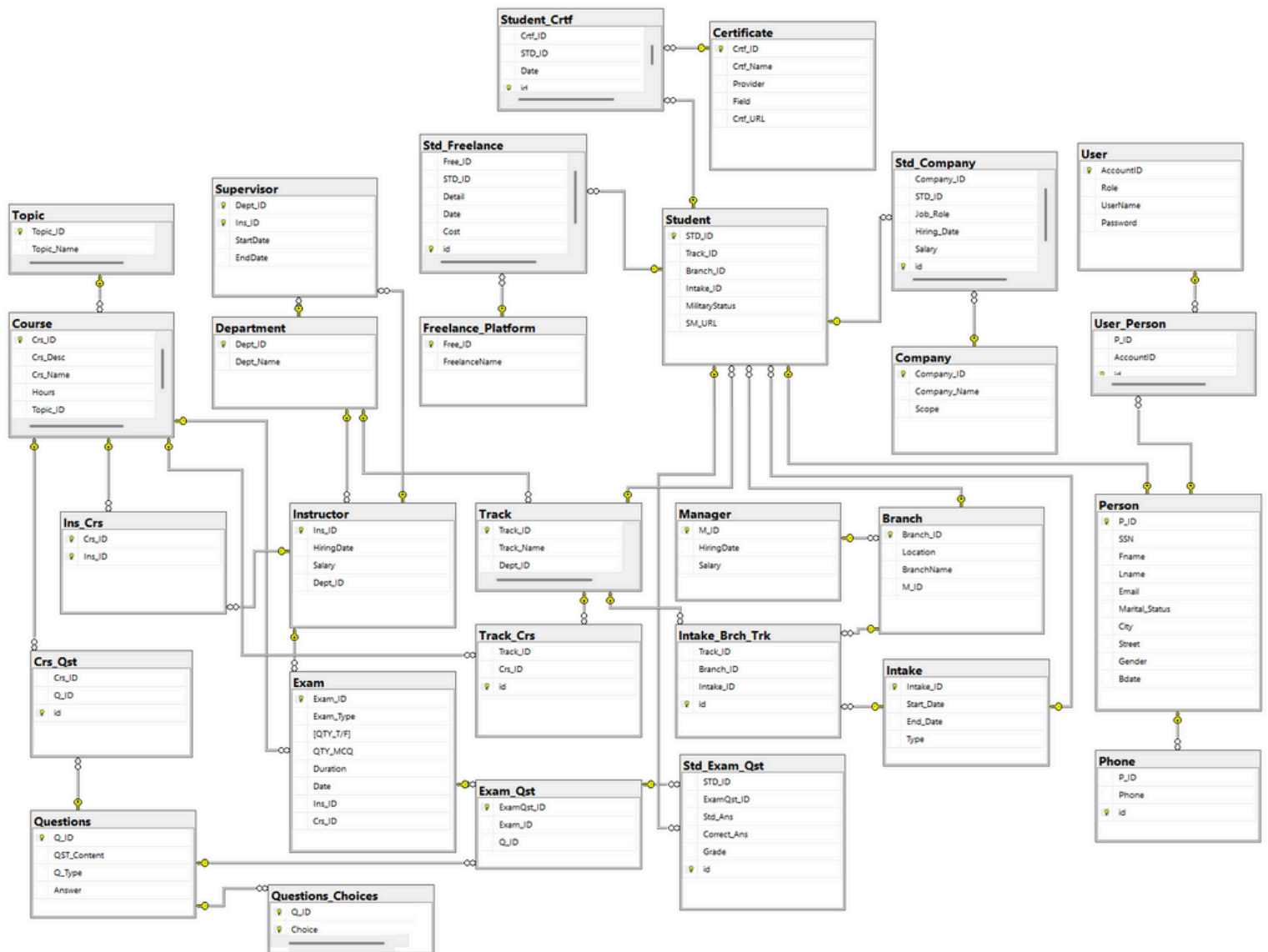
Freelance Platform	
Free_ID	FreelanceName

Std_Freelance				
Std_ID	Free_ID	Detail	Cost	Date

Certificate				
Crtf_ID	Crtf_Name	Field	Provider	Crtf_URL

Std_Crtf		
Std_ID	Crtf_ID	Date

Schema



Tables' Names

1. dbo.Branch

2. dbo.Certificate

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4. dbo.Course

5. dbo. Crs_Qst

6. dbo.Department

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22. dbo.Student

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25. dbo.Topic

26. dbo.Track

27. dbo.Track_Crs

28. dbo.User

29. dbo.User_Person

1. dbo.Branch

Column Name	Data Type	Constraints	Description
Branch_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier for each branch.
Location	[nvarchar]	NOT NULL	Physical location of the branch.
BranchName	[nvarchar]	NOT NULL, UNIQUE	Unique
M_ID	[int]	NOT NULL, FOREIGN KEY	ID of the manager

2. dbo.Certificate

Column Name	Data Type	Constraints	Description
Crtf_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier
Crtf_Name	[nvarchar]	NOT NULL, UNIQUE	Name of the certificate.
Provider	[nvarchar]	NOT NULL	Entity providing the certificate.
Field	[nvarchar]	NULL	Area or field of the certificate.
Crtf_URL	[nvarchar]	NULL	URL for more information about the certificate.

3. dbo.Company

Column Name	Data Type	Constraints	Description
Company_ID	[int]	PRIMARY KEY IDENTITY(1,1)	Unique identifier
Company_Name	[nvarchar]	NOT NULL, UNIQUE NONCLUSTERED	Name of the company
Scope	[nvarchar]	NULL, CHECK ('International' OR 'Local')	Scope of the company

4. dbo.Course

Column Name	Data Type	Constraints	Description
Crs_ID	[int]	PRIMARY KEY	Unique identifier
Crs_Desc	[nvarchar]	NOT NULL	Description of the course.
Crs_Name	[nvarchar]	NOT NULL	Name of the course.
Hours	[int]	NOT NULL	Total hours
Topic_ID	[int]	NOT NULL, FOREIGN KEY	ID of the topic

5. dbo.Crs_Qst

Column Name	Data Type	Constraints	Description
Crs_ID	[int]	NOT NULL, FOREIGN KEY	ID of the course.
Q_ID	[int]	NOT NULL, FOREIGN KEY	ID of the question.

6. dbo.Department

Column Name	Data Type	Constraints	Description
Dept_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier
Dept_Name	[nvarchar] (255)	NOT NULL, UNIQUE NONCLUSTERED	Unique name of the department.

7. dbo.Exam

Exam_ID	[int]	PRIMARY KEY CLUSTERED	Unique identifier for each exam.
Exam_Type	[nvarchar](50)	NOT NULL, CHECK ('Quiz' OR 'Mid-Term' OR 'Final')	Type of exam (Quiz, Mid-Term, or Final).
QTY_T/F	[int]	NOT NULL	Quantity of True/False questions in the exam.
QTY_MCQ	[int]	NOT NULL	Quantity of Multiple Choice Questions in the exam.
Duration	[int]	NOT NULL	Duration of the exam in minutes.
Date	[date]	NOT NULL	Date the exam is scheduled.
Ins_ID	[int]	NOT NULL, FOREIGN KEY	ID of the instructor responsible for the exam.
Crs_ID	[int]	NOT NULL, FOREIGN KEY	ID of the course the exam belongs to.

8. dbo.Exam_Qst

Column Name	Data Type	Constraints	Description
ExamQst_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier for the exam-question link.
Exam_ID	[int]	NOT NULL, FOREIGN KEY	ID of the exam.
Q_ID	[int]	NOT NULL, FOREIGN KEY	ID of the question.

9. dbo.Freelance_Platform

Column Name	Data Type	Constraints	Description
Free_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier for each freelance platform.
FreelanceName	[nvarchar]	NOT NULL, UNIQUE	Unique name of the freelance platform.

10. dbo.Ins_Crs

Column Name	Data Type	Constraints	Description
Crs_ID	[int]	PRIMARY KEY CLUSTERED, FOREIGN KEY	ID of the course.
Ins_ID	[int]	PRIMARY KEY CLUSTERED, FOREIGN KEY	ID of the instructor.

11. dbo.Instructor

Column Name	Data Type	Constraints	Description
Ins_ID	[int]	PRIMARY KEY CLUSTERED, FOREIGN KEY	Unique identifier
HiringDate	[date]	NOT NULL	Date the instructor was hired.
Salary	[int]	NOT NULL	Instructor's salary.
Dept_ID	[int]	NOT NULL, FOREIGN KEY	ID of the department the instructor belongs to.

12. dbo.Intake

Column Name	Data Type	Constraints	Description
Intake_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier
Start_Date	[date]	NOT NULL	Start date of the intake.
End_Date	[date]	NOT NULL, CHECK (End_Date > Start_Date)	End date of the intake. Must be after Start_Date.
Type	[nvarchar](10)	NOT NULL	Type of intake (e.g., "Summer", "Winter").

13. dbo.Intake_Brch_Trk

Column Name	Data Type	Constraints	Description
Track_ID	[int]	NOT NULL, FOREIGN KEY	ID of the track.
Branch_ID	[int]	NOT NULL, FOREIGN KEY	ID of the branch.
Intake_ID	[int]	NOT NULL, FOREIGN KEY	ID of the intake.

14. dbo.Manager

Column Name	Data Type	Constraints	Description
M_ID	[int]	PRIMARY KEY CLUSTERED	Unique identifier for each manager (also links to Person table).
HiringDate	[date]	NULL	Date the manager was hired.
Salary	[int]	NULL	Manager's salary.

15. dbo.Person

Column Name	Data Type	Constraints	Description
P_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier for each person.
SSN	[bigint]	NOT NULL	Social Security Number.
Fname	[nvarchar](50)	NOT NULL	First name of the person.
Lname	[nvarchar](50)	NOT NULL	Last name of the person.
Email	[nvarchar](50)	NOT NULL	Email address
Marital_Status	[nvarchar](50)	NOT NULL, CHECK ('Divorced' OR 'Single' OR 'Married')	Marital status (Divorced, Single, Married).
City	[nvarchar](50)	NOT NULL	City of residence.
Street	[nvarchar](50)	NULL	Street address of residence.
Gender	[nvarchar](50)	NOT NULL, CHECK ('Female' OR 'Male')	Gender (Female or Male).
Bdate	[date]	NOT NULL	Birth date of the person.

16. dbo.Phone

Column Name	Data Type	Constraints	Description
P_ID	[int]	NOT NULL, FOREIGN KEY	ID of the person the phone number belongs to.
Phone	[varchar](15)	NOT NULL	Phone number.

17. dbo.Questions

Column Name	Data Type	Constraints	Description
Q_ID	[int]	PRIMARY KEY CLUSTERED	Unique identifier for each question.
QST_Content	[nvarchar](255)	NOT NULL	Content/text of the question.
Q_Type	[nvarchar](50)	NOT NULL, CHECK ('MCQ' OR 'T/F')	Type of question (Multiple Choice or True/False).
Answer	[nvarchar](255)	NOT NULL	Correct answer for the question.

18. dbo.Questions_Choices

Column Name	Data Type	Constraints	Description
Q_ID	[int]	PRIMARY KEY CLUSTERED, FOREIGN KEY	ID of the question this choice belongs to.
Choice	[nvarchar](255)	PRIMARY KEY CLUSTERED	The text of the choice for the question.

19. dbo.Std_Company

Column Name	Data Type	Constraints	Description
Company_ID	[int]	NOT NULL, FOREIGN KEY	ID of the company.
STD_ID	[int]	NOT NULL, FOREIGN KEY	ID of the student.
Job_Role	[nvarchar] (255)	NOT NULL	Role or position held by the student.
Hiring_Date	[date]	NOT NULL	Date the student was hired.
Salary	[int]	NULL, CHECK (Salary > 0)	Salary of the student. Must be positive if provided.

20. dbo.Std_Exam_Qst

Column Name	Data Type	Constraints	Description
STD_ID	[int]	NOT NULL, FOREIGN KEY	ID of the student.
ExamQst_ID	[int]	NOT NULL, FOREIGN KEY	ID of the exam question (from Exam_Qst).
Std_Ans	[nvarchar](255)	NULL	The answer provided by the student.
Correct_Ans	[nvarchar](250)	NULL	The correct answer for the question.
Grade	[int]	NULL	Grade received for this specific question.

21. dbo.Std_Freelance

Column Name	Data Type	Constraints	Description
Free_ID	[int]	NOT NULL, FOREIGN KEY	ID of the freelance platform.
STD_ID	[int]	NOT NULL, FOREIGN KEY	ID of the student.
Detail	[nvarchar] (255)	NOT NULL	Details of the freelance project.
Date	[date]	NOT NULL	Date of the freelance project.
Cost	[int]	NOT NULL, CHECK (Cost > 0)	Cost/payment received for the project. Must be positive.

22. dbo.Student

Column Name	Data Type	Constraints	Description
STD_ID	[int]	PRIMARY KEY CLUSTERED, FOREIGN KEY	Unique identifier for each student (also links to Person table).
Track_ID	[int]	NOT NULL, FOREIGN KEY	ID of the track the student is enrolled in.
Branch_ID	[int]	NOT NULL, FOREIGN KEY	ID of the branch the student belongs to.
Intake_ID	[int]	NOT NULL, FOREIGN KEY	ID of the intake the student belongs to.
MilitaryStatus	[nvarchar](50)	NOT NULL, CHECK ('Postponed' OR 'Exempted' OR 'Completed')	Student's military status.
SM_URL	[nvarchar](255)	NULL	Social Media URL for the student.

23. dbo.Student_Crtf

Column Name	Data Type	Constraints	Description
Crtf_ID	[int]	NOT NULL, FOREIGN KEY	ID of the certificate.
STD_ID	[int]	NOT NULL, FOREIGN KEY	ID of the student.
Date	[date]	NOT NULL	Date the certificate was obtained.

24. dbo.Supervisor

Column Name	Data Type	Constraints	Description
Dept_ID	[int]	PRIMARY KEY CLUSTERED, FOREIGN KEY	ID of the department.
Ins_ID	[int]	PRIMARY KEY CLUSTERED, FOREIGN KEY	ID of the instructor acting as supervisor.
StartDate	[date]	NOT NULL	Start date of the supervision.
EndDate	[date]	NULL, CHECK (EndDate > StartDate)	End date of the supervision. Must be after StartDate if provided.

25. dbo.Topic

Column Name	Data Type	Constraints	Description
Topic_ID	[int]	PRIMARY KEY CLUSTERED	Unique identifier for each topic.
Topic_Name	[nvarchar](255)	NOT NULL	Name of the topic.

26. dbo.Track

Column Name	Data Type	Constraints	Description
Track_ID	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Unique identifier for each track.
Track_Name	[nvarchar](255)	NOT NULL, UNIQUE NONCLUSTERED	Unique name of the track.
Dept_ID	[int]	NOT NULL, FOREIGN KEY	ID of the department the track belongs to.

27. dbo.Track_Crs

Column Name	Data Type	Constraints	Description
Track_ID	[int]	NOT NULL, FOREIGN KEY	ID of the track.
Crs_ID	[int]	NOT NULL, FOREIGN KEY	ID of the course.

28. dbo.User

Column Name	Data Type	Constraints	Description
AccountID	[int]	PRIMARY KEY CLUSTERED	Unique identifier for the user account.
Role	[varchar](50)	NOT NULL	Role of the user (e.g., 'Admin', 'Instructor', 'Student').
UserName	[varchar](50)	NOT NULL	Username for login.
Password	[varchar](50)	NOT NULL	Password for the user account.

29. dbo.User_Person

Column Name	Data Type	Constraints	Description
P_ID	[int]	NOT NULL, FOREIGN KEY	ID of the person.
AccountID	[int]	NOT NULL, FOREIGN KEY	ID of the user account.

Relationships (Foreign Keys):

The database maintains data integrity and defines relationships between tables using Foreign Key constraints.

- **Branch**: Links to Manager (M_ID).
- **Course**: Links to Topic (Topic_ID).
- **Crs_Qst**: Links to Course (Crs_ID) and Questions (Q_ID).
- **Exam**: Links to Course (Crs_ID) and Instructor (Ins_ID).
- **Exam_Qst**: Links to Exam (Exam_ID) and Questions (Q_ID).
- **Ins_Crs**: Links to Course (Crs_ID) and Instructor (Ins_ID).
- **Instructor**: Links to Department (Dept_ID). Ins_ID in Instructor also serves as a foreign key to P_ID in Person.
- **Intake_Brch_Trk**: Links to Branch (Branch_ID), Intake (Intake_ID), and Track (Track_ID).
- **Phone**: Links to Person (P_ID).
- **Questions_Choices**: Links to Questions (Q_ID).
- **Std_Company**: Links to Company (Company_ID) and Student (STD_ID).
- **Std_Exam_Qst**: Links to Exam_Qst (ExamQst_ID) and Student (STD_ID).
- **Std_Freelance**: Links to Freelance_Platform (Free_ID) and Student (STD_ID).
- **Student**: Links to Branch (Branch_ID), Intake (Intake_ID), and Track (Track_ID). STD_ID in Student also serves as a foreign key to P_ID in Person.
- **Student_Crtf**: Links to Certificate (Crtf_ID) and Student (STD_ID).
- **Supervisor**: Links to Department (Dept_ID) and Instructor (Ins_ID).
- **Track**: Links to Department (Dept_ID).
- **Track_Crs**: Links to Course (Crs_ID) and Track (Track_ID).
- **User_Person**: Links to Person (P_ID) and User (AccountID).

Stored Procedures

CRUD Stored Procedures:

1. **dbo.Branch_SP**

Procedure Name	Description	Parameters	Target Table
Branch_Delete_SP	Delete a branch by ID	@Branch_ID INT	Branch
Branch_INSERT_SP	Insert new branch	@Location NVARCHAR(MAX), @BranchName NVARCHAR(MAX), @M_ID INT	Branch
Branch_Select_SP	Retrieve a branch	@Branch_ID INT	Branch
Branch_Update_SP	Update branch information	@Branch_ID INT, @Location NVARCHAR(MAX), @BranchName NVARCHAR(MAX), @M_ID INT	Branch

2. dbo.Certificate_SP

Procedure Name	Description	Parameters	Target Table
Certificate_Delete_SP	Delete certificate by ID	@certificate_ID INT	Certificate
Certificate_Insert_SP	Insert new certificate	@Crtf_Name, @Provider, @Field, @Crtf_URL	Certificate
Certificate_Select_SP	Retrieve certificate	@certificate_ID INT	Certificate
Certificate_Update_SP	Update certificate	@certificate_ID INT, remaining insert parameters	Certificate

3. dbo.Course_SP

Procedure Name	Description	Parameters	Target Table
Course_Delete_SP	Delete a course	@Crs_ID INT	Course
Course_Insert_SP	Insert new course	@Crs_ID, @Crs_Name, @Crs_Desc, @Hours, @Topic_ID	Course
Course_Select_SP	Retrieve course details	@Crs_ID INT	Course
Course_Update_SP	Update course information	same as insert parameters	Course

4. dbo.Department_SP

Procedure Name	Description	Parameters	Target Table
DEPT_DELETE_SP	Delete department	@Dept_ID INT	Department
DEPT_INSERT_SP	Insert new department	@Dept_Name NVARCHAR(MAX)	Department
DEPT_SELECT_SP	Retrieve department	@Dept_ID INT	Department
DEPT_UPDATE_SP	Update department info	@Dept_ID INT, @Dept_Name NVARCHAR(MAX)	Department

5. dbo.Instructor_SP

Procedure Name	Description	Parameters	Target Table
Instructor_Delete_SP	Delete instructor	@Ins_ID INT	Instructor
Instructor_Insert_SP	Insert new instructor	@Ins_ID, @HiringDate, @Salary, @Dept_ID	Instructor
Instructor_Select_SP	Retrieve instructor	@Ins_ID INT	Instructor
Instructor_Update_SP	Update instructor info	@Ins_ID, @HiringDate, @Salary, @Dept_ID	Instructor

6. dbo.Manager_SP

Procedure Name	Description	Parameters	Target Table
Manager_Delete_SP	Delete manager	@Manager_ID INT	Manager
Manager_Insert_SP	Insert new manager	@Manager_ID, @HiringDate, @Salary	Manager
Manager_Select_SP	Retrieve manager	@Manager_ID INT	Manager
Manager_Update_SP	Update manager info	@Manager_ID, @HiringDate, @Salary	Manager

7. dbo.Person_SP

Procedure Name	Description	Parameters	Target Table
Person_Delete_SP	Delete person	@P_ID INT	Person
Person_Insert_SP	Insert new person	@SSN, @FName, @LName, @Email, @Marital_Status, @City, @Street, @Gender, @BDate	Person
Person_Select_SP	Retrieve person	@P_ID INT	Person
Person_Update_SP	Update person info	all insert parameters	Person

8. dbo.Student_SP

Procedure Name	Description	Parameters	Target Table
Student_Delete_SP	Delete student	@STD_ID INT	Student
Student_Insert_SP	Insert new student	@STD_ID, @Track_ID, @Branch_ID, @Intake_ID, @MilitaryStatus, @SM_URL	Student
Student_Select_SP	Retrieve student	@STD_ID INT	Student
Student_Update_SP	Update student info	all insert parameters	Student

9. dbo.Track_SP

Procedure Name	Description	Parameters	Target Table
InsertTrack	Insert new track	@Track_Name, @Dept_ID	Track
DeleteTrack	Delete track	@Track_ID INT	Track
GetTrackNameByID	Get track name	@Track_ID INT	Track
UpdateTrack	Update track info	@Track_ID, @Track_Name, @Dept_ID	Track

10. dbo.Supervisor_SP

Procedure Name	Description	Parameters	Target Table
InsertSupervisor	Assign supervisor	@Ins_ID, @Dept_ID, @StartDate, @EndDate	Supervisor
DeleteSupervisor	Remove supervisor	@Ins_ID, @Dept_ID	Supervisor
GetSupervisorDetails	Get supervisor info	@Ins_ID	Supervisor
UpdateSupervisor	Update supervisor info	all insert parameters	Supervisor

11. dbo.Phone_SP

Procedure Name	Description	Parameters	Target Table
InsertPhoneForPerson	Add phone for person	@P_ID, @Phone	Phone
DeletePhoneByStudent	Delete phone by student	@P_ID, @Phone	Phone
UpdatePhoneForPerson	Update person's phone number	@P_ID, @OldPhone, @NewPhone	Phone
GetPhoneByPersonID	Retrieve phone numbers	@P_ID	Phone

12. dbo.Company_SP

Procedure Name	Description	Parameters	Target Table
InsertCompany	Insert new company	@Company_Name, @Scope	Company
DeleteCompany	Delete company	@Company_ID	Company
GetCompanyByID	Retrieve company	@Company_ID	Company
UpdateCompany	Update company information	@Company_ID, @Company_Name, @Scope	Company

13. dbo.Freelance_Platform_SP

Procedure Name	Description	Parameters	Target Table
InsertFreelancePlatform	Insert freelance platform	@FreelancePlatformName	Freelance_Platform
DeleteFreelancePlatform ByIDAndName	Delete freelance platform	@Free_ID, @FreelancePlatformName	Freelance_Platform
GetFreelancePlatform Name	Retrieve freelance platform by name	@FreelanceName	Freelance_Platform
UpdateFreelancePlatform	Update freelance platform	@Free_ID, @FreelancePlatformName	Freelance_Platform

14. dbo.Question_SP

Procedure Name	Description	Parameters	Target Table
Questions_Delete_SP	Delete a question	@Q_ID INT	Questions
Questions_Insert_SP	Insert a new question	@Q_ID, @QST_Content, @Q_Type, @Answer	Questions
Questions_Select_SP	Select a question	@Q_ID INT	Questions
Questions_Update_SP	Update question content	All question fields	Questions

15. dbo.Intake_SP

Procedure Name	Description	Parameters	Target Table
Intake_DELETE_SP	Delete intake	@Intake_ID INT	Intake
Intake_INSERT_SP	Insert new intake	@Intake_Year, @Intake_Name	Intake
Intake_SELECT_SP	Retrieve intake info	@Intake_ID INT	Intake
Intake_UPDATE_SP	Update intake info	@Intake_ID, @Intake_Year, @Intake_Name	Intake

16. dbo.Student_Certificate_SP

Procedure Name	Description	Parameters	Target Table
Student_Crtf_Insert_SP	Link student to certificate	@STD_ID, @certificate_ID	Std_Certificate
Student_Crtf_Delete_SP	Unlink student certificate	@STD_ID, @certificate_ID	Std_Certificate
Student_Crtf_Select_SP	Get student certificates	@STD_ID	Std_Certificate
Student_Crtf_Update_SP	Update student certificate link	all params	Std_Certificate

17. dbo.Student_Freelance_SP

Procedure Name	Description	Parameters	Target Table
Std_Freelance_DELETE_SP	Delete student freelance entry	@STD_ID, @Free_ID	Std_Freelance
Std_Freelance_INSERT_SP	Insert student freelance entry	@STD_ID, @Free_ID, @Hours	Std_Freelance
Std_Freelance_SELECT_SP	Retrieve student freelance info	@STD_ID	Std_Freelance
Std_Freelance_UPDATE_SP	Update student freelance info	@STD_ID, @Free_ID, @Hours	Std_Freelance

18. dbo.Topic_SP

Procedure Name	Description	Parameters	Target Table
Topic_Delete_SP	Delete topic	@Topic_ID INT	Topic
Topic_Insert_SP	Insert new topic	@Topic_Name	Topic
Topic_Select_SP	Retrieve topic	@Topic_ID INT	Topic
Topic_Update_SP	Update topic	@Topic_ID, @Topic_Name	Topic

19. dbo.Question_Choices_SP

Procedure Name	Description	Parameters	Target Table
Questions_Choices_INSERT_SP	Insert a question choice	@Q_ID, @Choice	Questions_Choices
Questions_Choices_DELETE_SP	Delete a question choice	@Q_ID, @Choice	Questions_Choices
Questions_Choices_UPDATE_SP	Update a question choice	@Q_ID, @Old_Choice, @New_Choice	Questions_Choices
Questions_Choices_SELECT_SP	Select choices for question	@Q_ID	Questions_Choices

20. dbo.Exam_SP

Procedure Name	Description	Parameters	Target Table
Exam_Delete_SP	Delete an exam	@Exam_ID INT	Exam
Exam_Insert_SP	Insert new exam	@Crs_ID, @Exam_Type, @Duration, @Exam_Date, @Ins_ID	Exam
Exam_Select_SP	Retrieve exam	@Exam_ID INT	Exam
Exam_Update_SP	Update exam info	All fields as in insert	Exam

21. dbo.User_SP

Procedure Name	Description	Parameters	Target Table
User_Delete_SP	Delete user	@AccountID INT	[User]
User_Insert_SP	Insert new user	@AccountID, @Role, @UserName	[User]
User_Select_SP	Retrieve user	@AccountID INT	[User]
User_Update_SP	Update user info	@AccountID, @Role, @UserName	[User]

22. Reports Procedure

Procedure Name	Description	Parameters	Target Tables
Get_Exam_Questions_Choices_Report	Exam questions and their choices	@Exam_ID	Exam, Questions, Choices
Get_Student_Answers_Report	Report on student's answers	@Exam_ID, @STD_ID	Std_Exam_Qst
Get_Student_Grades_Report	Student's grades and scores	@Std_ID	Std_Exam_Qst
Get_Instructor_Courses_And_StudentCount	Courses with instructor and student count	@Ins_ID	Instructor, Course
Get_Courses_By_Topic	Retrieve courses by topic	@Topic_ID	Course, Topic
Get_Certificate_By_Provider	Retrieve certificates by provider	@Provider	Certificate

23. Exams Procedure

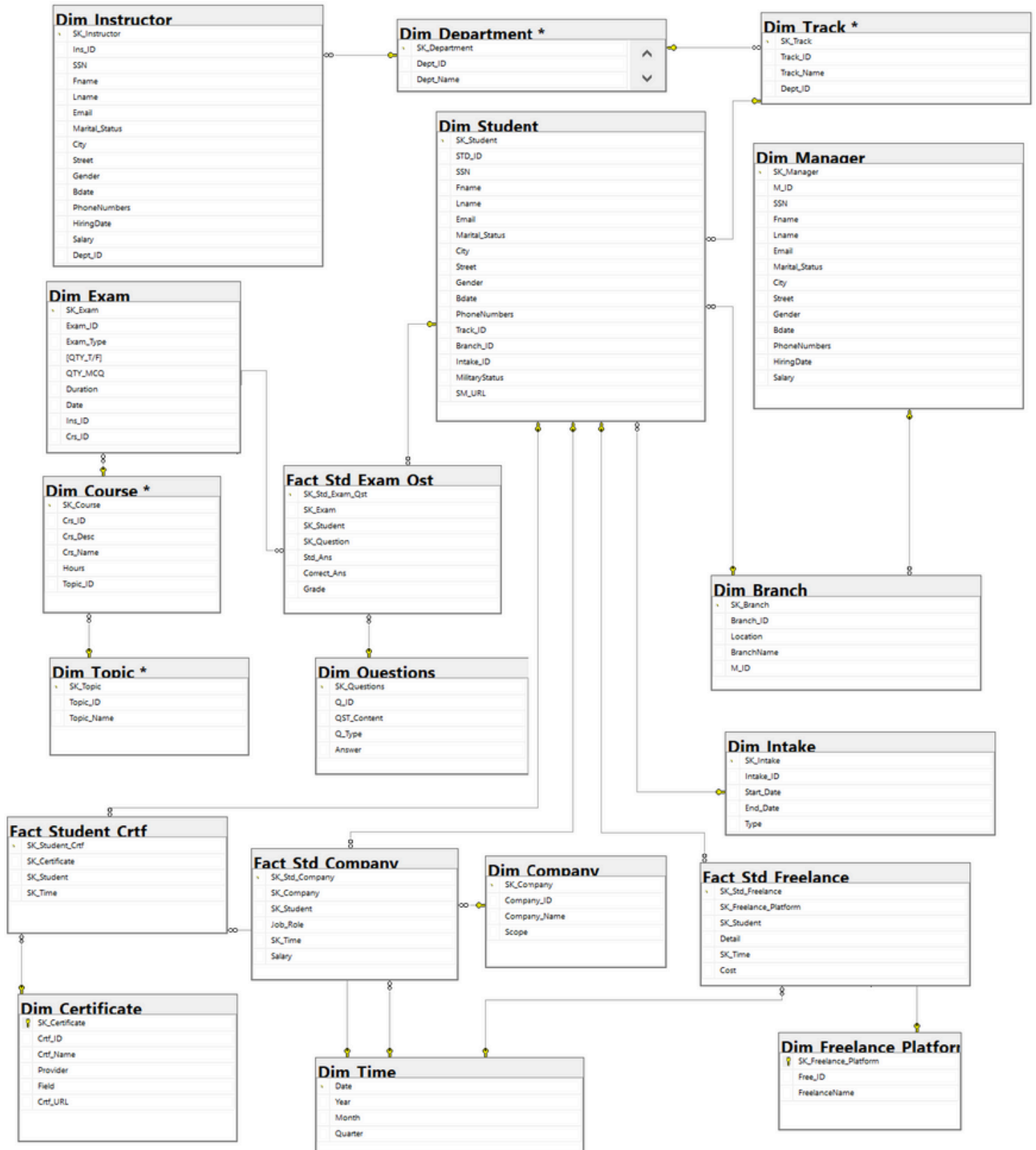
Procedure Name	Description	Parameters (Simplified)	Target Tables
GenerateExam	Automatically generate a new exam	@Crs_ID, @Exam_Type, @Duration, @Exam_Date, @Ins_ID, @Exam_ID OUT	Exam, Exam_Qst
Exam_ans	Store student answers	@Std_ID, @Exam_ID, @ans1 .. @ans8	Std_Exam_Qst
Exam_Correction	Correct and score student answers	@Std_ID, @Exam_ID	Std_Exam_Qst

Data Warehouse

ITI Examination System (Dimensional Model)

This document provides detailed documentation for the dimensional model designed for the ITI Examination System. This schema is optimized for analytical querying and reporting, featuring Dimension Tables (Dim_) and Fact Tables (Fact_).

Data Warehouse Schema



Dimension Tables

Dimension tables store descriptive attributes related to the business processes, enabling detailed analysis of the facts. Each dimension table typically includes a surrogate key (SK_) as its primary key, along with natural keys from the source system for integration.

1. Dim_Branch

Column Name	Data Type	Constraints	Description
SK_Branch	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the branch dimension.
Branch_ID	[int]	UNIQUE NONCLUSTERED	Natural Key from the source system.
Location	[nvarchar](255)	NULL	Physical location of the branch.

2. Dim_Certificate

SK_Certificate	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key
Crtf_ID	[int]	NULL	Natural Key
Crtf_Name	[nvarchar]	NULL	Name of the certificate.
Provider	[nvarchar]	NULL	Entity providing the certificate.

3.Dim_Company

Column Name	Data Type	Constraints	Description
SK_Company	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the company dimension.
Company_ID	[int]	NULL	Natural Key from the source system.
Company_Name	[nvarchar](255)	NULL	Name of the company.

4.Dim_Course

Column Name	Data Type	Constraints	Description
SK_Course	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the course dimension.
Crs_ID	[int]	UNIQUE NONCLUSTERED	Natural Key from the source system.
Crs_Desc	[nvarchar](255)	NULL	Description of the course.
Crs_Name	[nvarchar](255)	NULL	Name of the course.
Hours	[int]	NULL	Total hours for the course.
Topic_ID	[int]	NULL	Topic ID (foreign key to Dim_Topic).

5.Dim_Department

Column Name	Data Type	Constraints	Description
SK_Department	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key
Dept_ID	[int]	UNIQUE NONCLUSTERED	Natural Key .
Dept_Name	[nvarchar] (255)	NOT NULL, UNIQUE NONCLUSTERED	Name of the department.
Supervisor_ID	[int]	NULL	ID of the supervisor.
Column Name	Data Type	Constraints	Description
SK_Department	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the department dimension.

6.Dim_Exam

Column Name	Data Type	Constraints	Description
SK_Exam	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the exam dimension.
Exam_ID	[int]	NULL	Natural Key from the source system.
Exam_Type	[nvarchar](50)	NULL	Type of exam (e.g., 'Quiz', 'Mid-Term').
QTY_T/F	[int]	NULL	Quantity of True/False questions.
QTY_MCQ	[int]	NULL	Quantity of Multiple Choice Questions.
Duration	[int]	NULL	Duration of the exam in minutes.
Date	[date]	NULL	Date of the exam.
Ins_ID	[int]	NULL	Instructor ID.
Crs_ID	[int]	NULL	Course ID.
Column Name	Data Type	Constraints	Description

7. Dim_Instructor

Column Name	Data Type	Constraints	Description
SK_Instructor	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the instructor dimension.
Ins_ID	[int]	NOT NULL	Natural Key from the source system.
SSN	[bigint]	NOT NULL	Social Security Number.
Fname	[nvarchar](50)	NOT NULL	First name of the instructor.
Lname	[nvarchar](50)	NOT NULL	Last name of the instructor.
Email	[nvarchar](50)	NOT NULL	Email address.
Marital_Status	[nvarchar](50)	NOT NULL, CHECK ('Divorced' OR 'Single' OR 'Married')	Marital status.
City	[nvarchar](50)	NOT NULL	City of residence.
Street	[nvarchar](50)	NULL	Street address.
Gender	[nvarchar](50)	NOT NULL, CHECK ('Female' OR 'Male')	Gender
Bdate	[date]	NOT NULL	Birth date.
Phone Numbers	[nvarchar](max)	NOT NULL	Consolidated phone numbers.
HiringDate	[date]	NULL	Date of hiring.
Salary	[int]	NULL	Instructor's salary.
Dept_ID	[int]	NULL	Department ID (foreign key to Dim_Department)

8. Dim_Intake

Column Name	Data Type	Constraints	Description
SK_Intake	[int]	PRIMARY KEY IDENTITY(1,1)	Surrogate Key
Intake_ID	[int]	UNIQUE	Natural Key
Start_Date	[date]	NULL	Start date of the intake.
End_Date	[date]	NULL	End date of the intake.
Type	[nvarchar] (10)	NULL	Type of intake (e.g., 'Summer', 'Winter').

9.Dim_Manager

Column Name	Data Type	Constraints	Description
SK_Manager	[int]	PRIMARY KEY	Surrogate Key
M_ID	[int]	NOT NULL, UNIQUE	Natural Key
SSN	[bigint]	NOT NULL	Social Security Number.
Fname	[nvarchar]	NOT NULL	First name of the mng
Lname	[nvarchar]	NOT NULL	Last name of the mng
Email	[nvarchar]	NOT NULL	Email address.
Marital_Status	[nvarchar]	NOT NULL, CHECK ('Divorced' OR 'Single' OR 'Married')	Marital status.
City	[nvarchar]	NOT NULL	City of residence.
Street	[nvarchar]	NULL	Street address.
Gender	[nvarchar]	NOT NULL, CHECK ('Female' OR 'Male')	Gender.

Bdate	[date]	NOT NULL	Birth date.
PhoneNumbers	[nvarchar](max)	NOT NULL	Consolidated phone numbers.
HiringDate	[date]	NULL	Date of hiring.
Salary	[int]	NULL	Manager's salary.

10.Dim_Questions

Column Name	Data Type	Constraints	Description
SK_Questions	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the question dimension.
Q_ID	[int]	NULL	Natural Key
QST_Content	[nvarchar](255)	NULL	Content
Q_Type	[nvarchar](50)	NULL	Type of question (e.g., 'MCQ', 'T/F').
Answer	[nvarchar](255)	NULL	Correct answer to the question

11.Dim_Student

Column Name	Data Type	Constraints	Description
SK_Student	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the student dimension.
STD_ID	[int]	NULL	Natural Key from the source system.
SSN	[bigint]	NOT NULL	Social Security Number.
Fname	[nvarchar](50)	NOT NULL	First name of the student.
Lname	[nvarchar](50)	NOT NULL	Last name of the student.
Email	[nvarchar](50)	NOT NULL	Email address.
Marital_Status	[nvarchar](50)	NOT NULL, CHECK ('Divorced' OR 'Single' OR 'Married')	Marital status.
City	[nvarchar](50)	NOT NULL	City of residence.
Street	[nvarchar](50)	NULL	Street address.
Gender	[nvarchar](50)	NOT NULL, CHECK ('Female' OR 'Male')	Gender.

Track_ID	[int]	NULL	Track ID (foreign key to Dim_Track).
Branch_ID	[int]	NULL	Branch ID (foreign key to Dim_Branch).
Intake_ID	[int]	NULL	Intake ID (foreign key to Dim_Intake).
MilitaryStatus	[nvarchar](50)	NULL, CHECK ('Postponed' OR 'Exempted' OR 'Completed')	Military status.
SM_URL	[nvarchar](255)	NULL	Social Media URL.

12.Dim_Time

Column Name	Data Type	Constraints	Description
Date	[date]	PRIMARY KEY CLUSTERED, UNIQUE NONCLUSTERED	The date itself, serving as the primary key.
Year	[int]	NULL	The year of the date.
Month	[int]	NULL	The month of the date (1-12).
Quarter	[int]	NULL	The quarter of the year (1-4).

13. Dim_Topic

Column Name	Data Type	Constraints	Description
SK_Topic	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate
Topic_ID	[int]	UNIQUE NONCLUSTERED	Natural Key
Topic_Name	[nvarchar](255)	NULL	Name
Column Name	Data Type	Constraints	Description
SK_Topic	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key
Topic_ID	[int]	UNIQUE NONCLUSTERED	Natural Key from source
Topic_Name	[nvarchar](255)	NULL	Name of the topic.

14. Dim_Track

Column Name	Data Type	Constraints	Description
SK_Track	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for the track dimension.
Track_ID	[int]	UNIQUE NONCLUSTERED	Natural Key from the source system.
Track_Name	[nvarchar](255)	NULL	Name of the track.
Dept_ID	[int]	NULL	Department ID (foreign key to Dim_Department).

Fact Tables

Fact tables store quantitative measurements or "facts" about business events. They contain foreign keys to dimension tables and numerical measures.

1. Fact_Std_Company

Column Name	Data Type	Constraints	Description
SK_Std_Company	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for this fact record.
SK_Company	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Company.
SK_Student	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Student.
Job_Role	[nvarchar](255)	NULL	The job role of the student.
SK_Time	[date]	NULL, FOREIGN KEY	Foreign Key to Dim_Time for hiring date.
Salary	[int]	NULL	Salary of the student in this role.

2. Fact_Std_Exam_Qst

Column Name	Data Type	Constraints	Description
SK_Std_Exam_Qs	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate
SK_Exam	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Exam.
SK_Student	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Student.
SK_Question	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Questions.
Std_Ans	[nvarchar] (255)	NULL	The answer provided by the student.
Correct_Ans	[nvarchar] (250)	NULL	The correct answer to the question.
Grade	[int]	NULL	Grade received for this specific question.

3. Fact_Std_Freelance

Column Name	Data Type	Constraints	Description
SK_Std_Freelance	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for this fact record.
SK_Freelance_Platform	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Freelance_Platform.
SK_Student	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Student.
Detail	[nvarchar](255)	NULL	Details of the freelance project.
SK_Time	[date]	NULL, FOREIGN KEY	Foreign Key to Dim_Time for project date.
Cost	[int]	NULL	Cost or earnings from the project

4. Fact_Student_Crtf

Column Name	Data Type	Constraints	Description
SK_Student_Crtf	[int]	PRIMARY KEY CLUSTERED, IDENTITY(1,1)	Surrogate Key for this fact record.
SK_Certificate	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Certificate.
SK_Student	[int]	NULL, FOREIGN KEY	Foreign Key to Dim_Student.
SK_Time	[date]	NULL, FOREIGN KEY	Foreign Key to Dim_Time for certification date.