



# Module 7

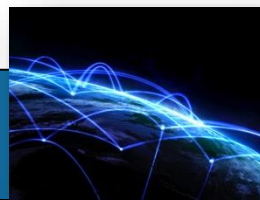
## ERD Rules and Problem Solving

### Lesson 2: Extended Diagram Rules



# Lesson Objectives

- Apply diagram rules to detect consistency errors in identification dependency representation
- Eliminate redundant foreign keys in an ERD
- Explain limitations of diagram rules



# Diagram Rules

- Ensure that ERD notation is correctly used
- Like syntax rules for a computer language
- Consistency rules: no conflicts among specifications
- Supported by the ER Assistant

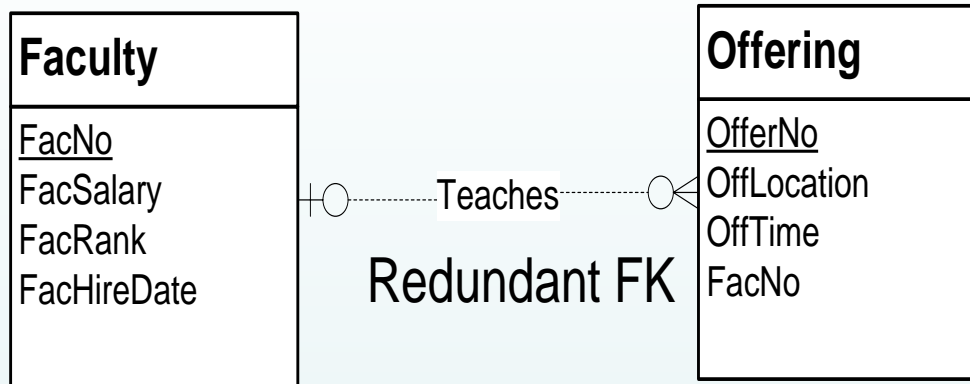


# Connection Consistency Rules

- Relationship/Entity Connection Rule: relationships connect two entity types (not necessarily distinct)
- Relationship/Relationship Connection Rule: relationships are not connected to other relationships
- Redundant Foreign Key Rule: foreign keys are not used.



# Redundant FK Violation

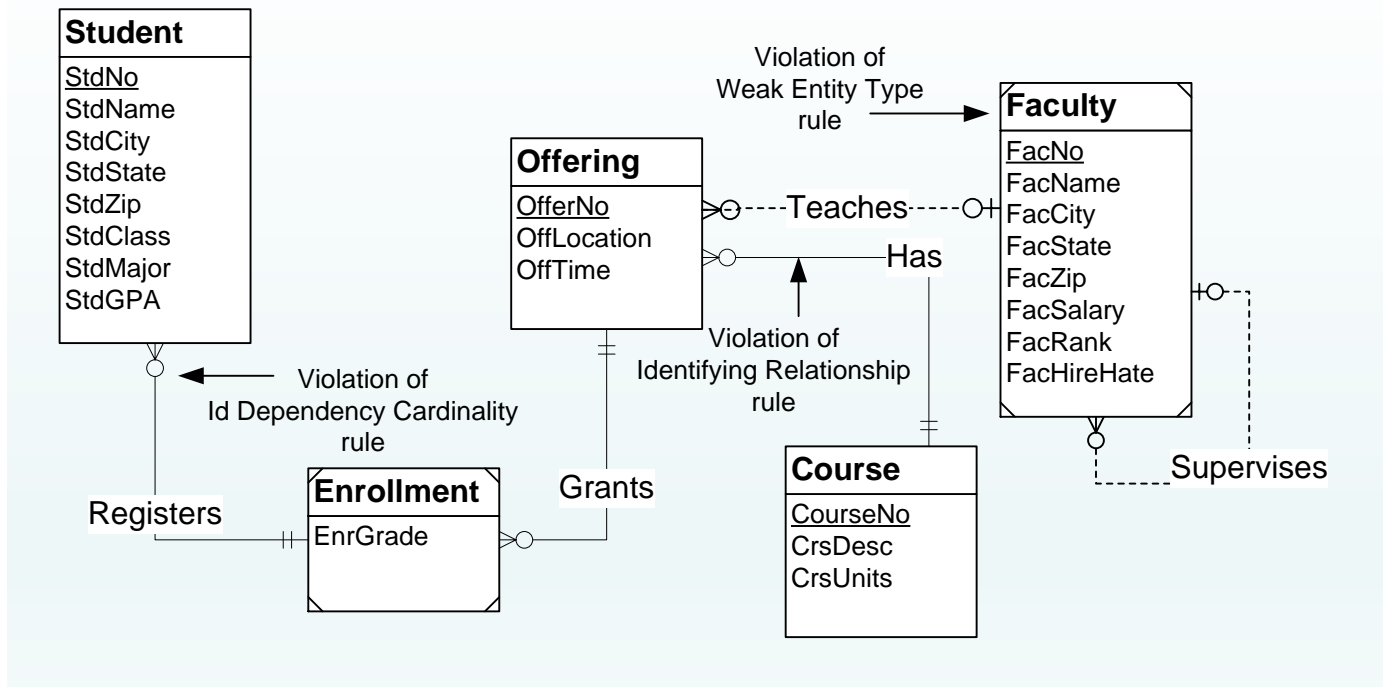


# Identification Dependency Rules

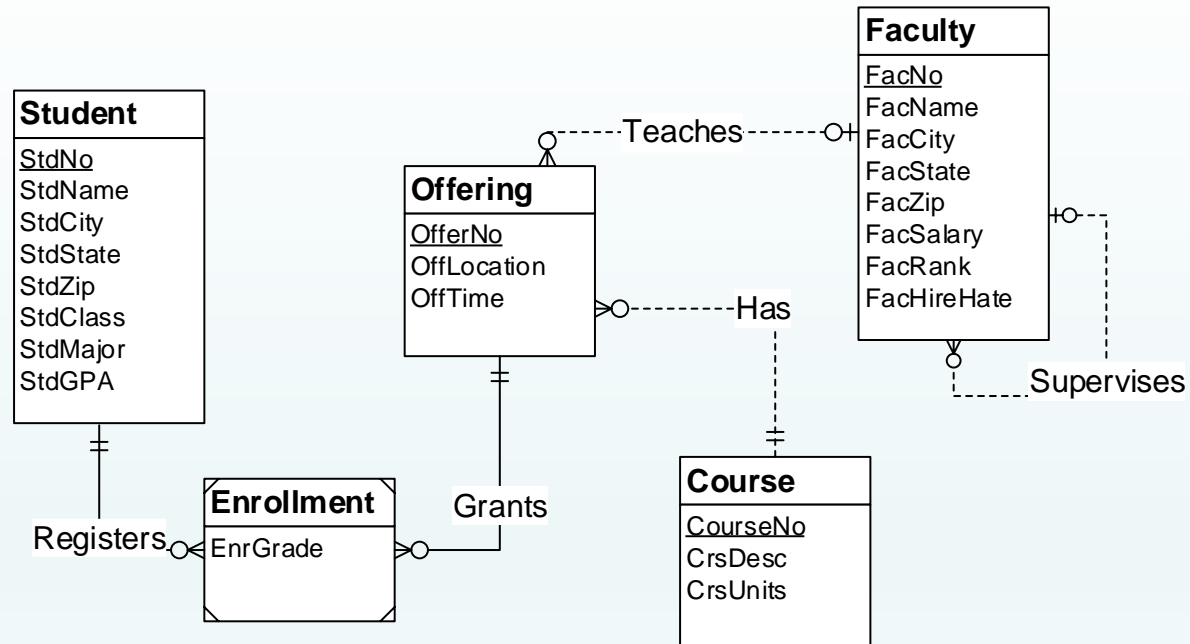
- Weak entity type rule: weak entity types have at least one identifying relationship
- Identifying relationship rule: at least one participating entity type must be weak for each identifying relationship
- Identification dependency cardinality rule: the minimum and maximum cardinality must equal 1 for a weak entity type in all identifying relationships



# Identification Dependency Violations



# Corrected ERD





# Support in the ER Assistant

- Relationship formation rules are supported by diagram construction
- Other rules are supported by the Check Diagram feature
- For the Redundant Foreign Key rule, the ER Assistant detects FKs that have the same name as the associated PKs



# Support in Visual Paradigm

- Feature rich tool with community and commercial editions
- Support for relationship rules through diagram construction
- Limited support for identification dependency rules
- Explicitly shows foreign keys



# Summary

- Use the diagram rules to ensure structural consistency and completeness
- Identification dependency is the most common source of errors
- Use the ER Assistant for detection of notational errors

