

# **Creating Entity Relationship Diagrams in MS Visio**

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## 1. Introduction

This tutorial demonstrates the process of setting up Microsoft Visio to create both a Relational Diagram (RD) and an Entity Relationship Diagram (ERD) with Crow's Foot notation and relationship naming. You can either use MS Visio on Citrix or use a copy installed on your computer. You can get a free copy of MS Visio from the Student Software Store (see the Course Home for the link).

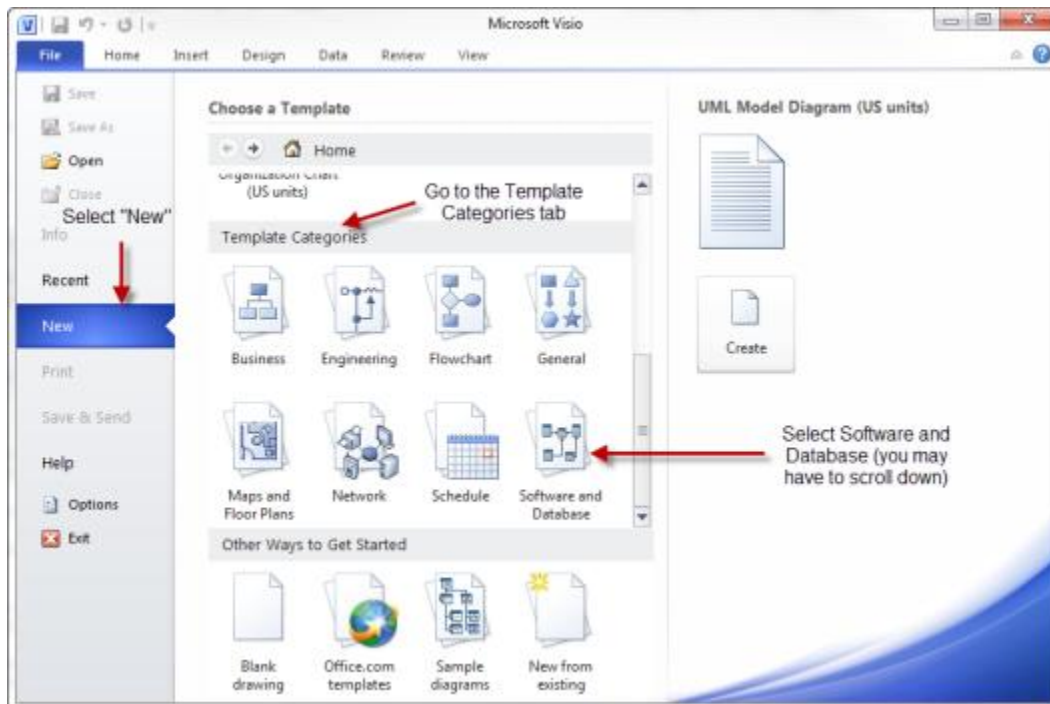
This tutorial is not an all-inclusive tutorial, but instructions here that are demonstrated with a simple Entity Relationship Diagram are sufficient for you to complete the first couple of lab assignments. As you progress in the course, you will learn about more advanced and finer details of creating Entity Relationship Diagrams and how to display the advanced features in an MS Visio Entity Relationship Diagram.

## 2. Starting MS Visio in Citrix

1. If you are using Citrix, after you have logged into a Citrix session select Microsoft Office 2010 applications.
2. Open the MS Office folder.
3. Select and double click Microsoft Visio 2010 to start the application.

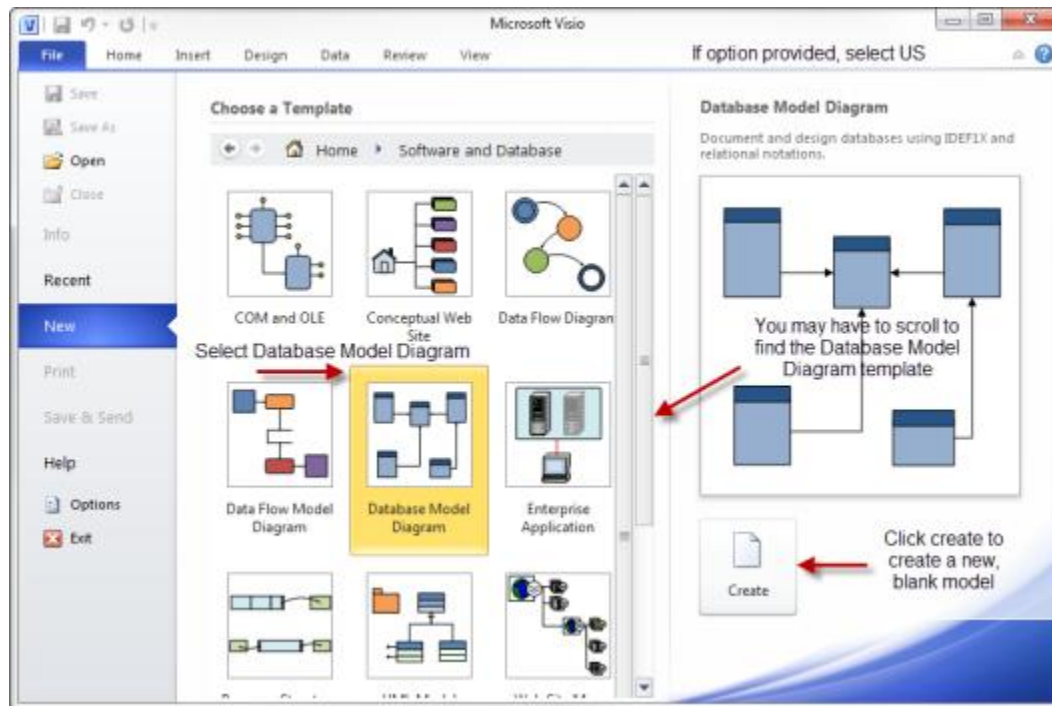
## 3. Once Visio is Started

Under the Template Categories, select Software and Database.



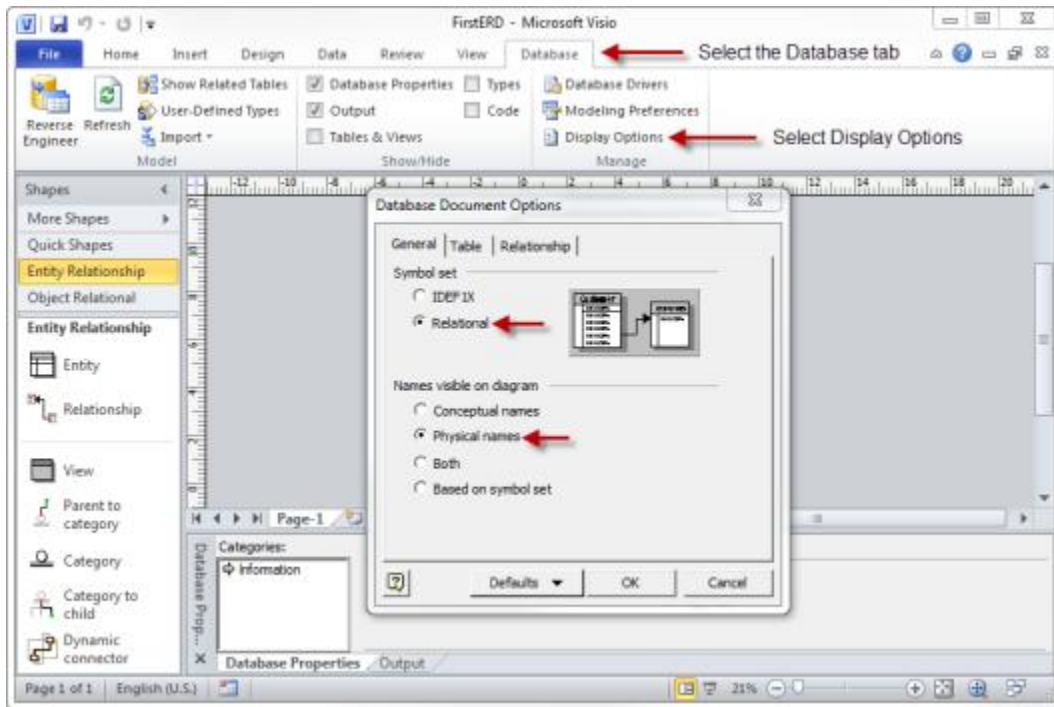
**Figure 1: Selecting the Software Database Template**

1. When the Software and Database templates are displayed, select and click on the Database Model Diagram template.
2. If the option is displayed, check US Units next to the Measure Units.
3. Click the Create button.



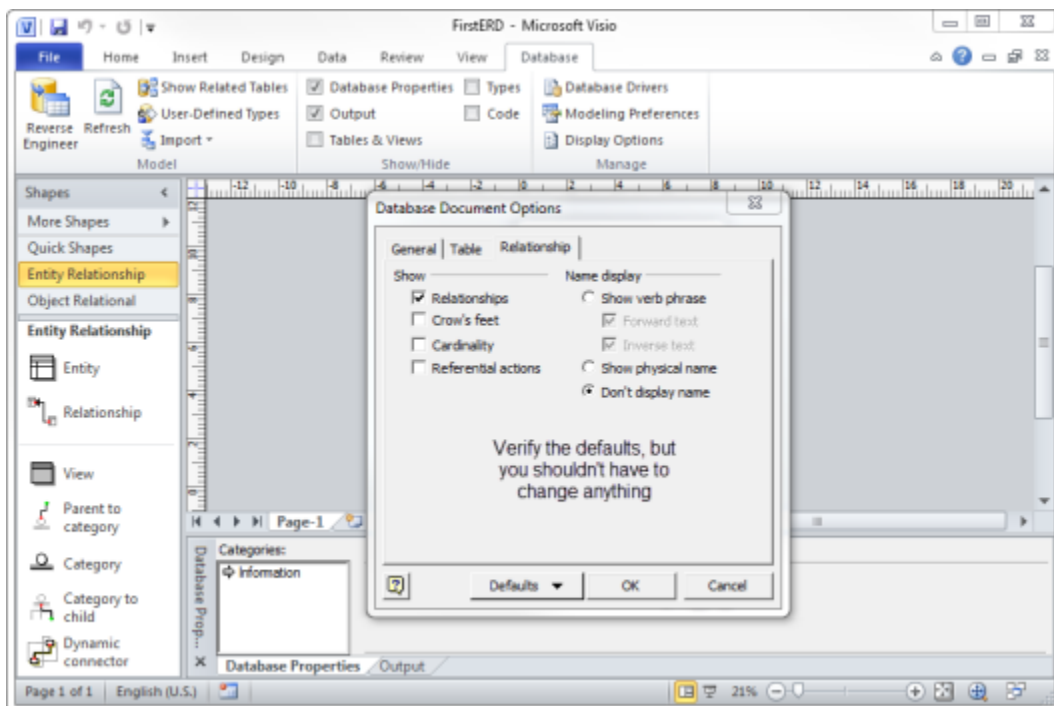
**Figure 2: Selecting the Database Model**

4. Save the database in a known location and provide a logical name to the file.
5. Select the Database table from the Ribbon
6. Select the Display Options operation
7. Ensure that the "Relational" and "Physical names" options are selected



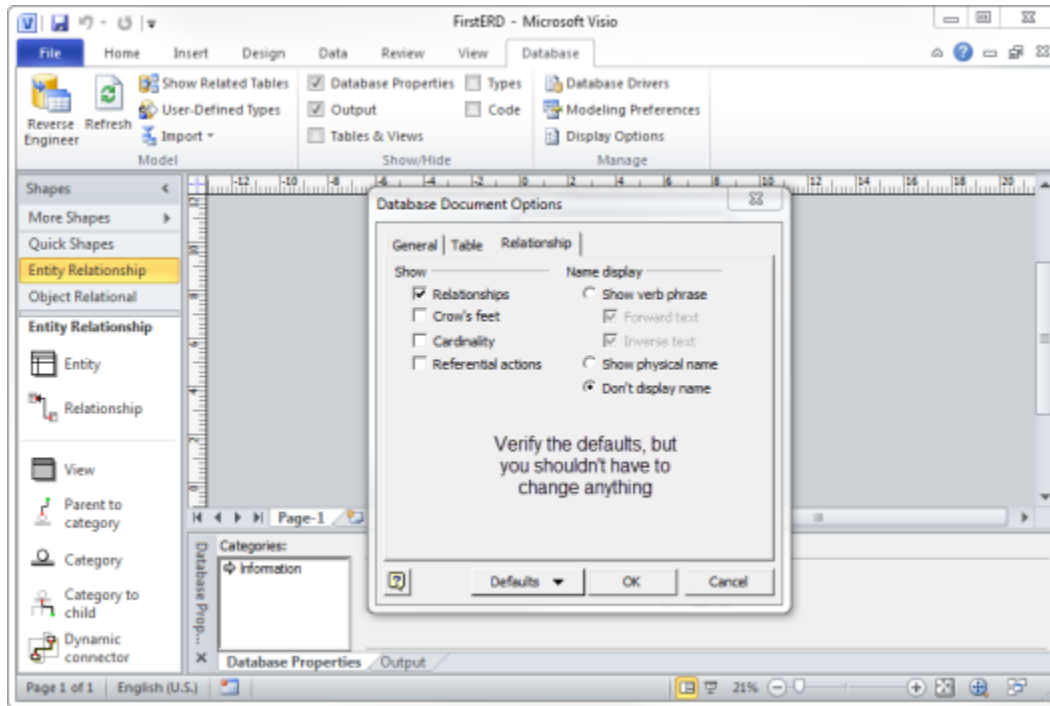
**Figure 3: Document Options: General**

8. Select the Table tab.
9. Verify the default settings listed below, but you should not have to make any changes.



**Figure 4: Document Options: Table**

10. Click on the Relationship tab.
11. The default settings should look like the following figure, where under the Show section, Relationships is checked, and the other options (Crow's feet, Cardinality, and Referential actions) are unchecked.) Under the Name Display section the "Don't Display Name" option is selected, and the other items are then deselected (Show Verb Phrase and Show physical name).
12. Click OK to close this box and save any changes.



**Figure 5: Document Options: Relationships**

13. In the Shapes window on the left of the diagram, select "Entity Relationships" and then the shape templates for an ERD will be displayed in the "Entity Relationship" Window.
14. For each entity (table) in your design, drag an entity shape from the left side of the window onto the grid. Make sure the object you select is an ENTITY and not a VIEW.
15. If the images on the screen are too small, you can zoom in by sliding the "Zoom" control on the bottom right of the window

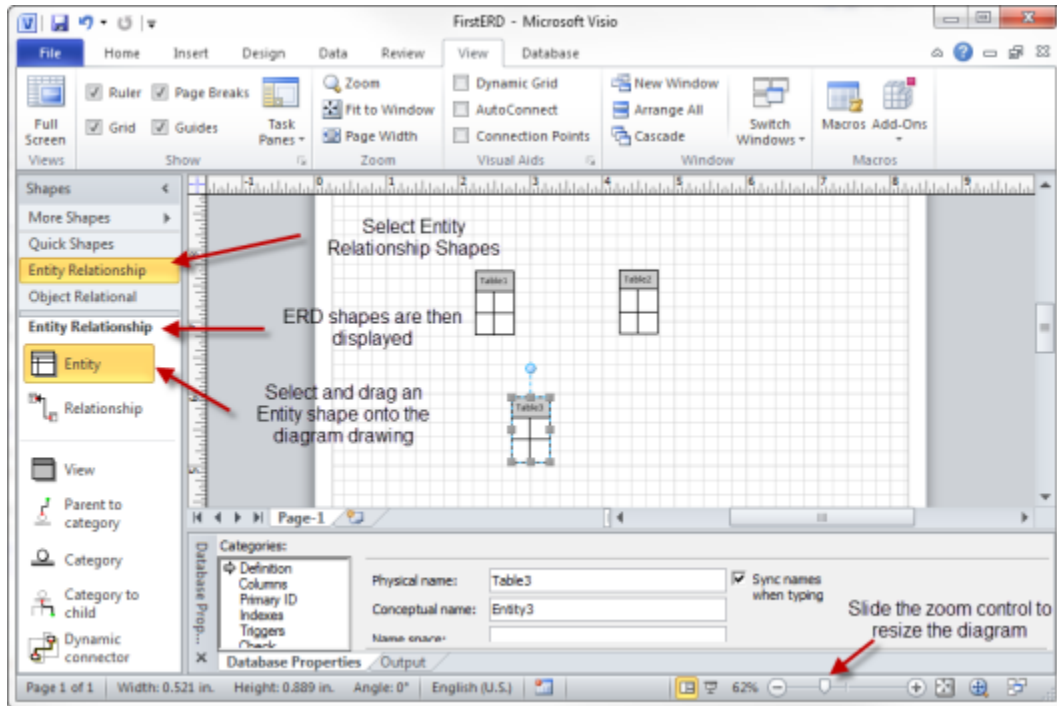


Figure 6: Creating Entities

16. Click on an entity and you should see the Database Properties dialogue box displayed at the bottom of the screen.
17. Select Definition from the list under Categories.
18. Type the name of your first entity in the Physical name box.
19. Check "Sync names when typing".
20. You should see the name you typed in the box displayed in the entity on the grid.

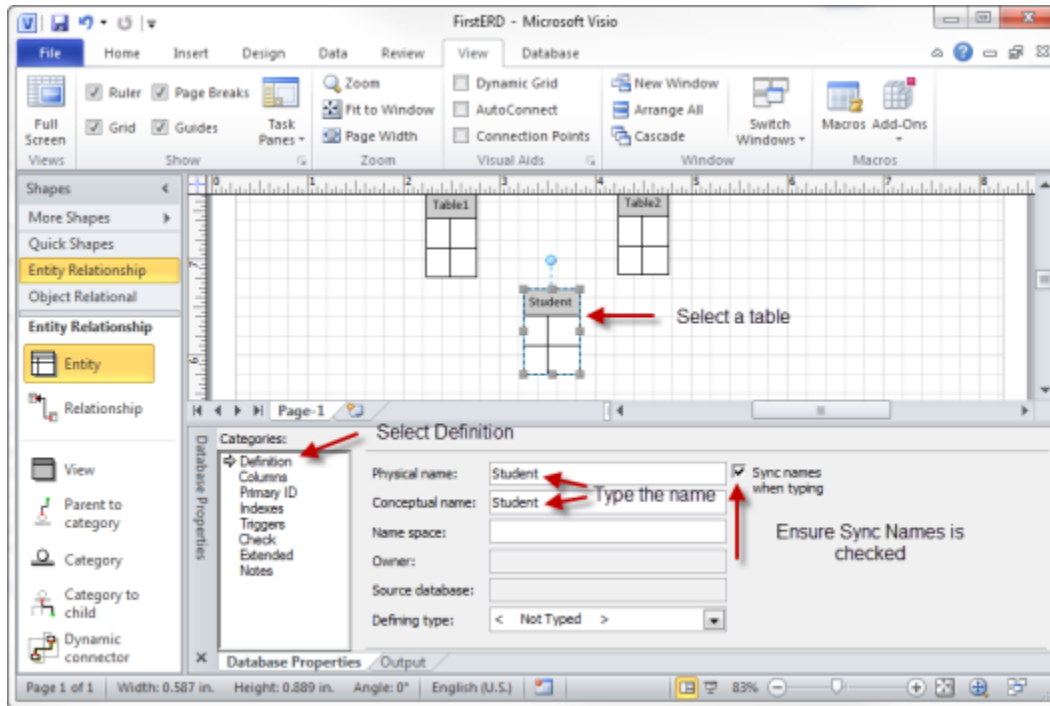
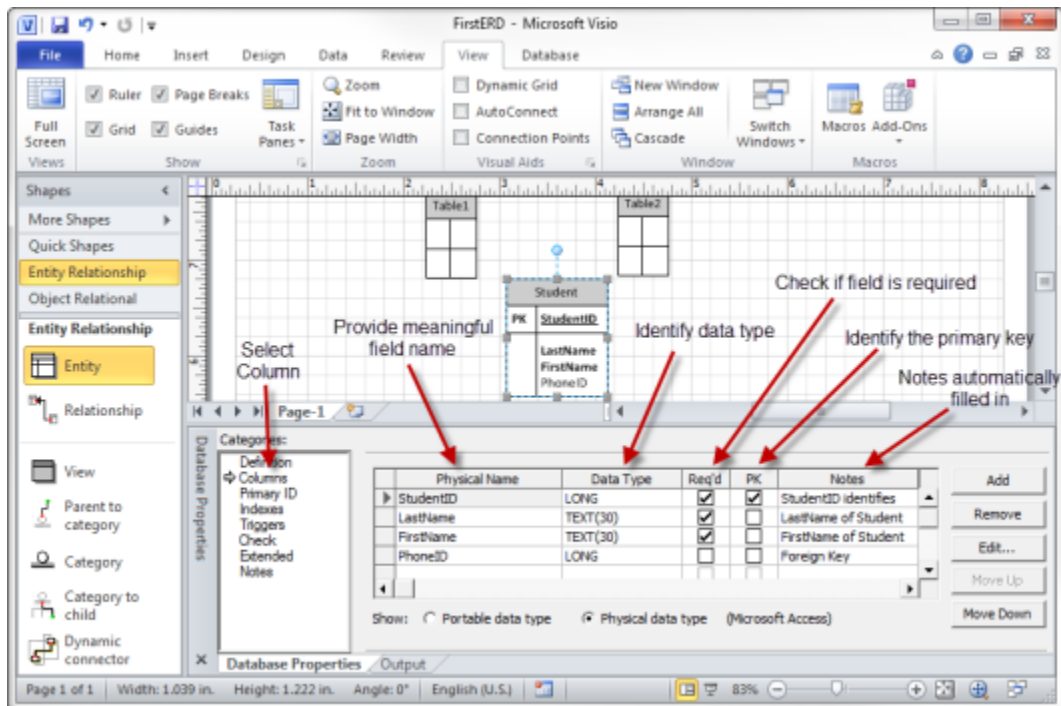


Figure 7: Database Properties: Entity Definition



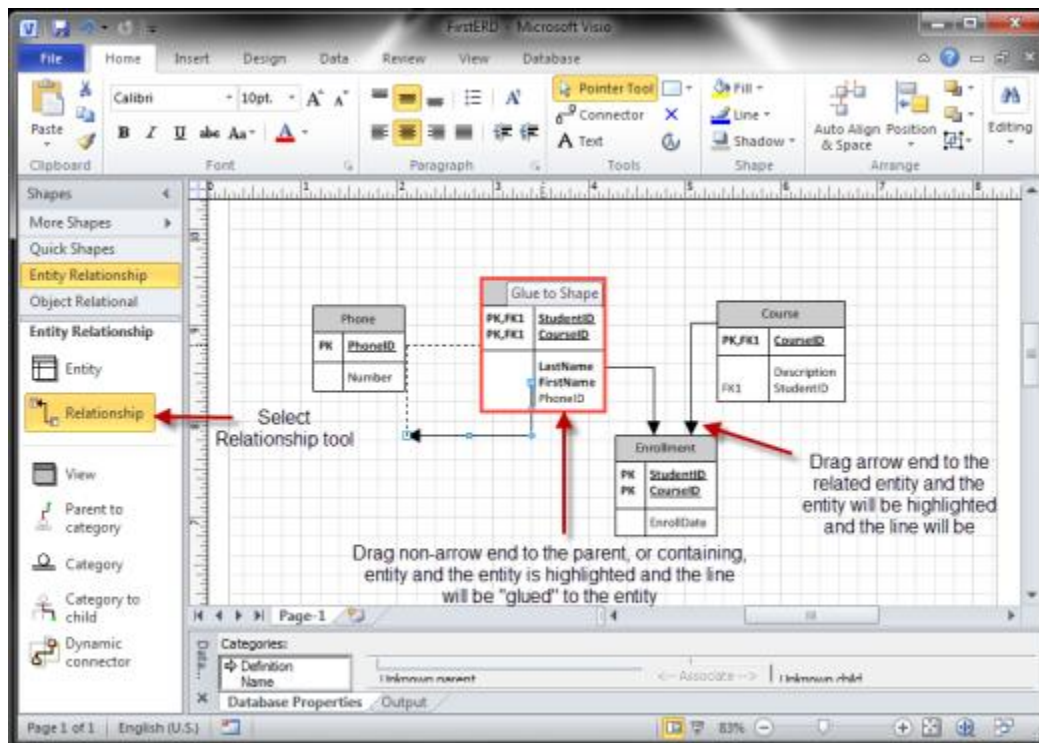
21. Select Columns under Categories.
22. Type in the name of each column you wish to display in the entity.
23. Identify the data type (note: the numbers in parenthesis can be edited by double clicking the field)
24. Check Required boxes where applicable.
25. Check the Primary Key (PK) box for field(s) that are the primary keys
26. The Notes field for each column is automatically filled in, but you can edit the Notes field by double clicking the note text
27. Select the next entity and complete the steps for all the entities (tables) in your database



**Figure 8: Database Properties: Columns**

28. Now you need to create the relationships between the entities you have created.
29. Select the Relationship tool from the Entity Relationship shapes.
30. When placing relationship connectors, you will always start with parent entities. The parent is always on the "one" side of the relationship. In Visio, the Relationship line WITHOUT the arrow will be dragged anywhere in the parent, or containing, entity figure. When you do this, you will notice the entity will be highlighted in red, and once you release the mouse button the end of the relationship line will be automatically glued to the entity figure.

31. Click on the relationship line, and then drag the arrow end of the line to the related entity and the related entity will be highlighted, and then release the end and the line will then be glued to the related entity.
32. Repeat creating the relationships for each of the entities and relationships in the database.



### Figure 9: Creating Relationships

33. Repeat the process to create the relationships between all the entities.

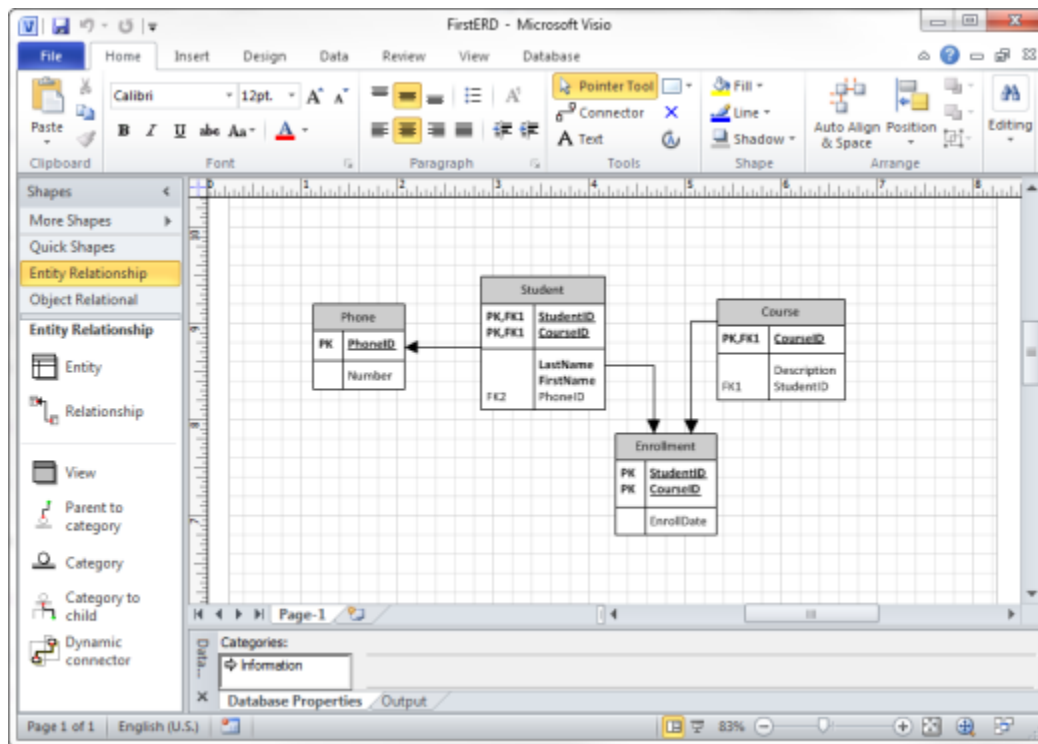
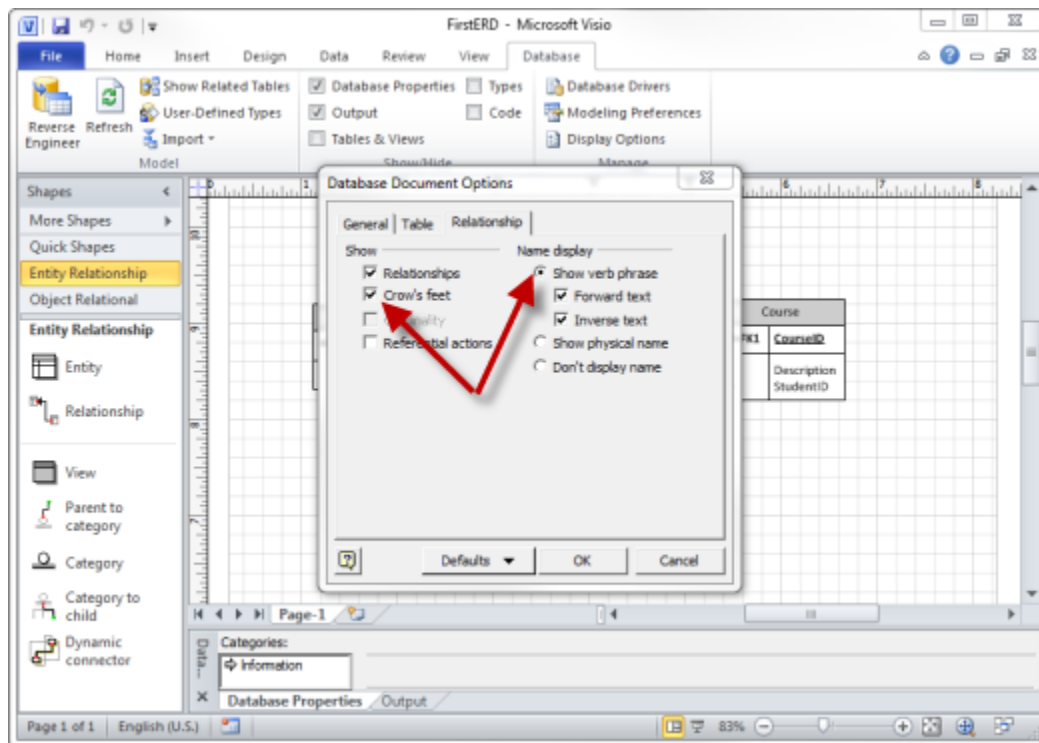


Figure 10: Creating Relationships

#### 4. Completing the Entity Relationship Diagram

1. Select Database tab in the Ribbon.
2. Select Display Options operation
3. Select the Relationship tab
4. Check Crow's Feet under Show.
5. Select Show verb phrase under Name display.
6. Check Forward text and Inverse text.
7. Click OK



**Figure 11: Database Document Options: Relationships**

You should now see that the relationship lines no longer have arrows pointing to the parent entities. Instead there are various lines and circles to represent cardinality and composition.

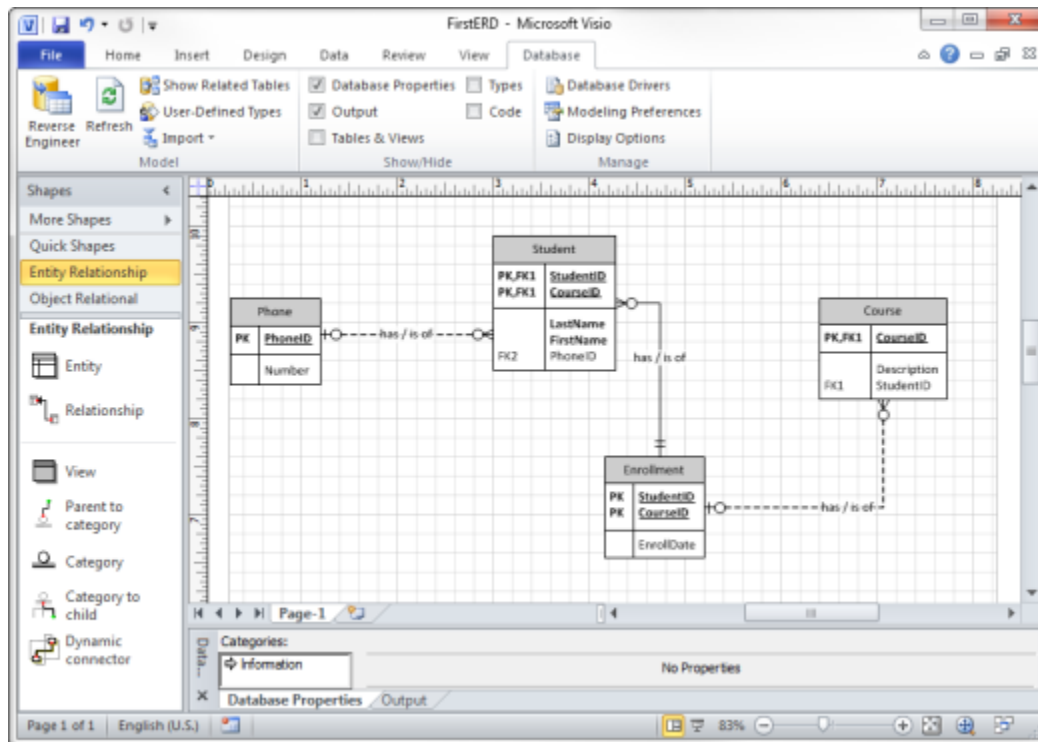


Figure 12: Entity Relationships

## 5. Modifying an Existing Relationship

1. Click on the relationship between two entities. This will display the properties for the relationship in the Database Properties box at the bottom of the screen.

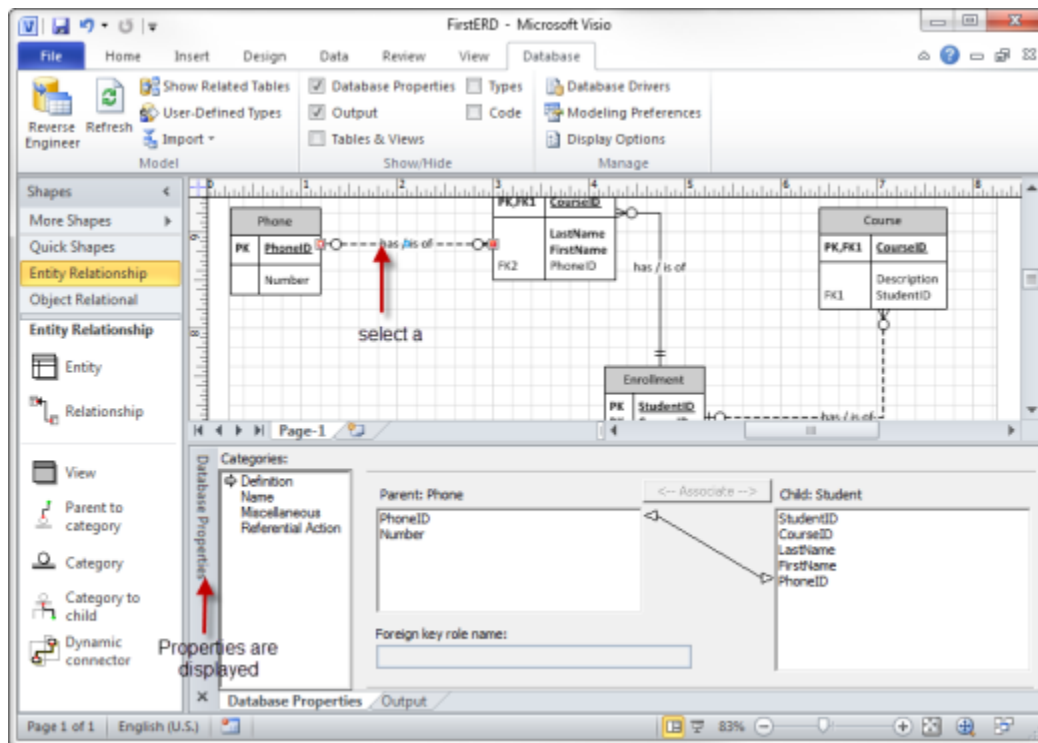
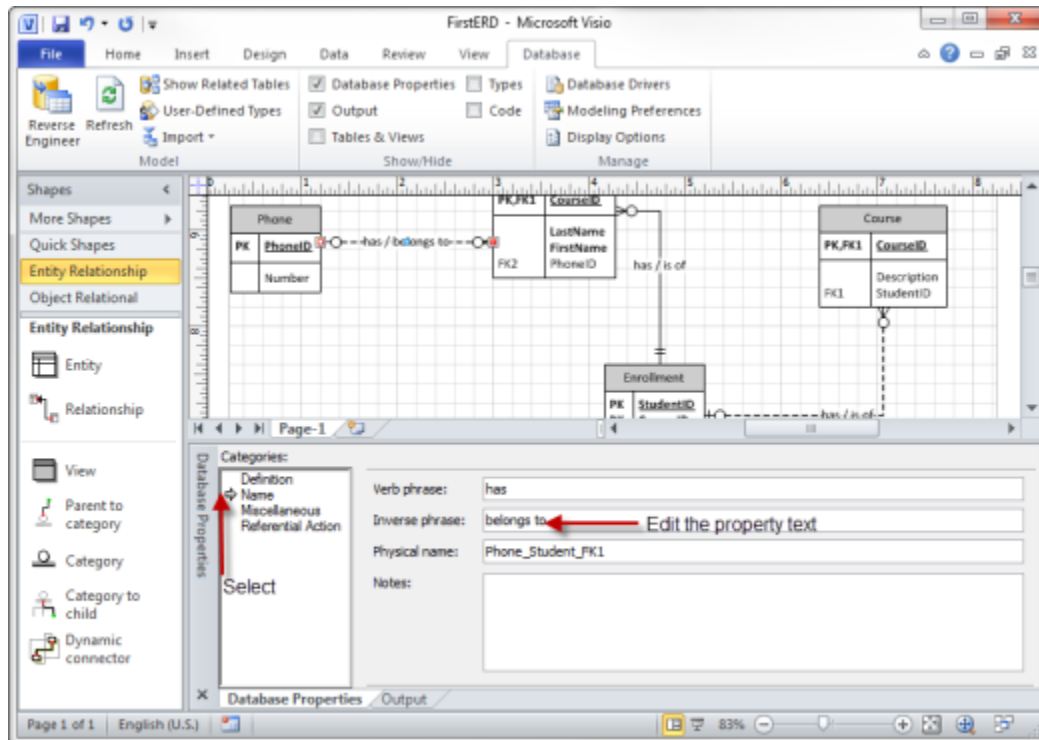


Figure 13: Modifying Existing Relationships

2. Click Name from the Categories. This will display the default verb phrases has/is of that describe the relationship. These may accurately define the relationship, but in many instances, you can modify any of the property text values. For example, a student has many phones and a phone belongs to one student. So the verb phrase would be has/belongs to. You can modify any of the objects properties using this technique.



**Figure 14: Modifying Existing Relations**

3. Select Miscellaneous from the Categories.
4. Select the appropriate cardinality from the list of choices. In this example, Cardinality "one or more" is selected, and Relationship Type of "Identifying" is selected.
5. On the Student side of the relationship, the line closest to Student has "crows feet" lines, which represents that a phone number can be associated with one or many students (makes sense if several students live in the same house or apartment). To read a relationship you start with the entity where the line begins, and then read it from the beginning entity to the dependent entity and the relationship phrase and cardinality is then that information closet to the dependent entity. In this case, you read the Phone-Student relationship as "A phone belongs to one or many students".

6. On the Phone side of the line, the double pipe "||" specifies that every student must have only one phone associated with the student. Then reading the Student-Phone relationship as "A Student must have only one phone".)
7. Repeat the steps to modify the entity and relationship properties until the complete Entity Relationship Diagram is complete.

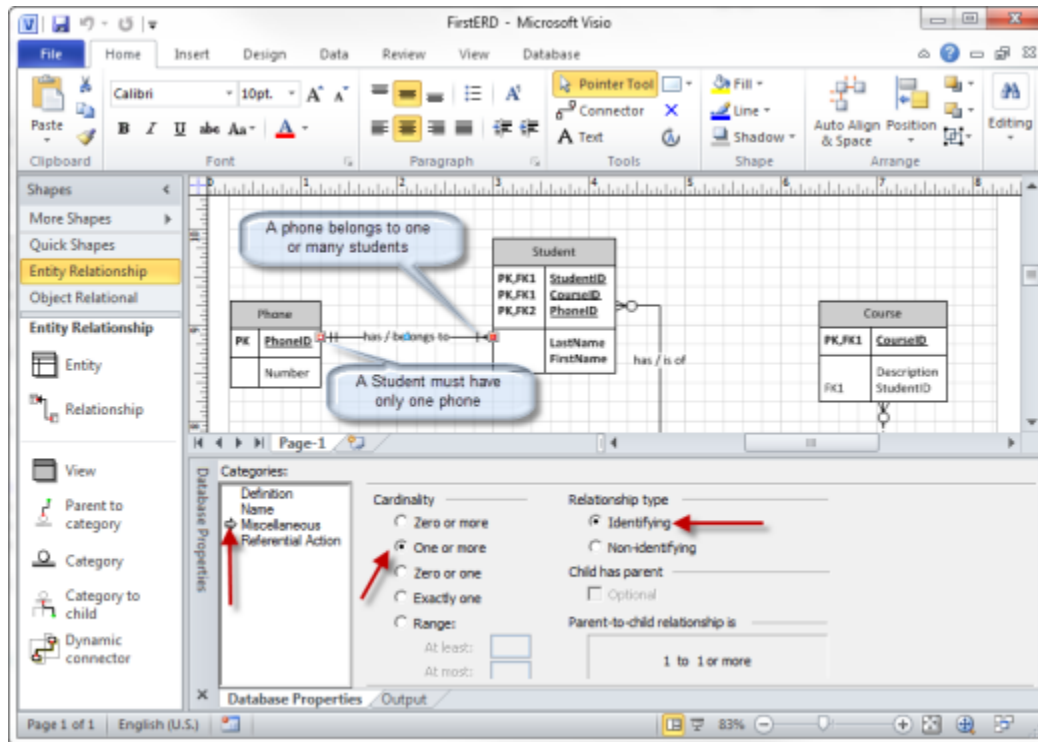


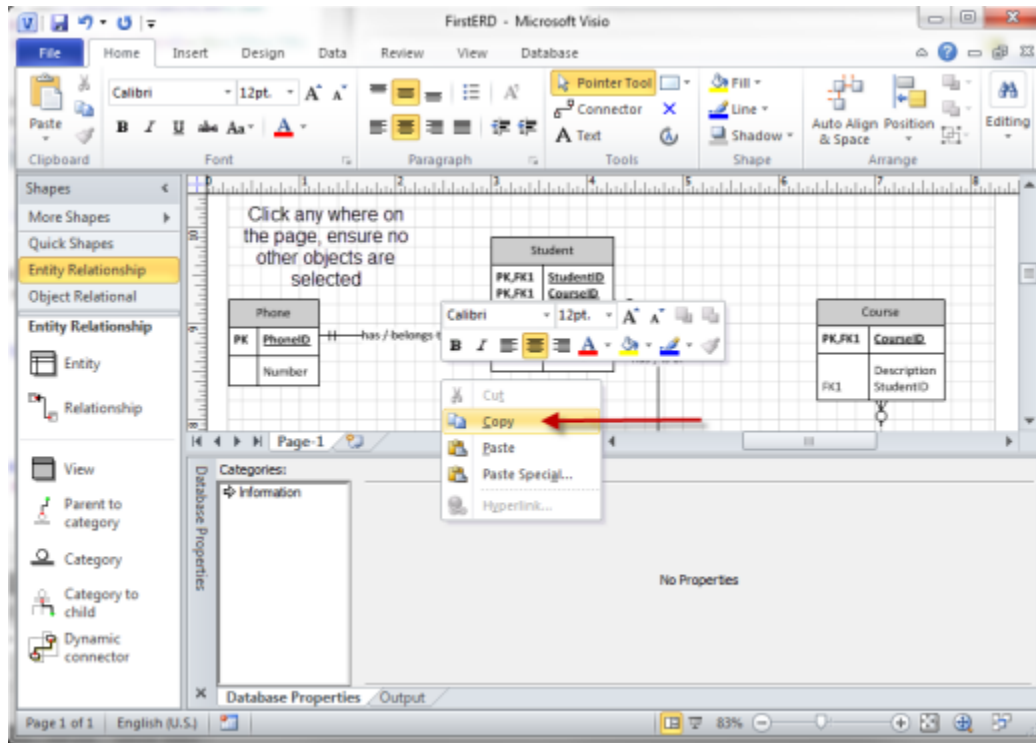
Figure 15: Reading a Relationship



## 6. Submitting Your Work

**MS Visio documents contain a .vsd extension and can only be displayed within Visio. For the purposes of your labs you will need to copy your diagram and paste it into a MS word document.**

1. To copy the diagram, click anywhere on a blank part of the drawing page, and ensure no objects are selected
2. Right click and click "Copy"



**Figure 16: Copying a Diagram**

3. Open a MS Word document.
4. Right click where you want to and select "Paste Special" and select "Device Independent Bitmap" to copy the diagram into Word. By using Paste Special you will reduce the size of the Word file.
5. Be sure to tab down several lines in Word before you paste in the diagram so that you can type a heading above it.

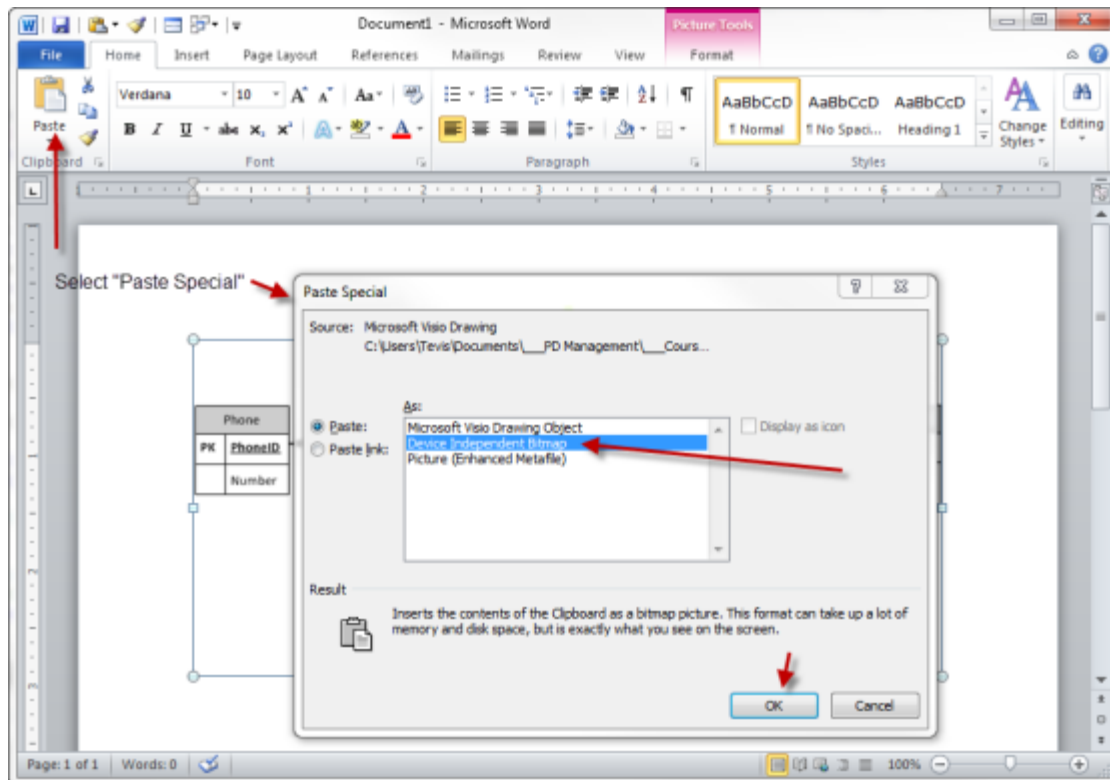


Figure 17: Pasting ERD into MS Word