Course Database Element:

In my project the Data Element class will essentially just be a memory structure, it will have simple getters and setters for its four fields and no other methods.

Course Database Structure:

This will be a hash table with linked chaining implementation. Elements will be hashed with the modulus operator and if the bucket they are hashed to contains elements it will be ensured that the bucket does not contain a course that has the same CRN if an add operation is being performed. Adding an element is just a call to add() on the linked list if the bucket already has a linked list, if it does not a linked list will first be created before the element is added.

The database Structure will also have a toArray method for utility. Courses will be returned unsorted as Database Elements.

Course Database Manager:

The Database Manager will have passthrough methods for get and add to the underlying database structure. It will also adapt the toArray method of Database Structure to return an array of String representations of Database Elements sorted alphabetically. To read a database in from a file a scanner will be used as the File Picker from Java libraries returns a File which is easily read line by line(each class is on a line) by the Scanner class. The Strings read from the File will be split along spaces and used to create Database Element objects with some conversion from String to int required for CRN and credit count.