```java
import java.util.LinkedList;

/**********************************************************
* Dalton Nofs                                             *
* Login ID: nofs5491                                      *
* CS-102, Summer 2017                                     *
* Programming Assignment 3                                *
* CourseSearch class:  used to search a database for a course *
**********************************************************/
public class CourseSearch
{
    /**********************************************************
    * Method: findByTitle()                                    *
    * Purpose: Searches database for matching course number      *
    *                                                            *
    * Parameters:                                               *
    *         String: courseTitle: Course title to search for    *
    *         Database: targetDatabase: database to be searched  *
    * Returns:                                                   *
    *         Void: nothing to be returned                       *
    **********************************************************/
    public void findByTitle(String courseTitle, Database targetDatabase) throws NoSuchFieldException
    {
        String buffer = ""; // Out buffer

        // Search given database for a matching string
        for(int index=0; index<targetDatabase.getArraySize(); index++)
        {
            int numCourses = targetDatabase.get(index).size();
            // Loop courses
            for(int index2=0;index2<numCourses;index2++)
            {
                if(targetDatabase.getArrayPosition(index,index2).getCourseTitle().
                        toLowerCase().contains(courseTitle.toLowerCase()))
                {
                    // Add the class attributes to the buffer
                    buffer += targetDatabase.getArrayPosition(index,index2).
                                getCourseNumber() + ": " +
                              targetDatabase.getArrayPosition(index,index2).
                                  getCourseTitle()  + " (" +
                              targetDatabase.getArrayPosition(index,index2).
                                  getCreditCount()  + "). "+
                              targetDatabase.getArrayPosition(index,index2).
                                  getTermTaken()     + " "  +
                              targetDatabase.getArrayPosition(index,index2).
                                  getYearTaken()     + " "  +
                              targetDatabase.getArrayPosition(index,index2).
                                  getCourseGrade()  + "\n"    ;
                }
            }
        }
        if(!buffer.equals(""))
        {
            System.out.println("Results:");
            System.out.println(buffer);
            buffer = ""; // clear buffer
        }
        // Throw exception as no match was found
        else{throw new NoSuchFieldException();}
    }

    /**********************************************************
    * Method: findByNumber()                                   *
    * Purpose: Searches database for matching course number      *
    *                                                            *
    * Parameters:                                               *
    *         String: courseNumber: Course number to search for  *
    *         Database: targetDatabase: database to be searched  *
    * Returns:                                                   *
    *         LinkedList<Integer>: list of course indexes        *
    **********************************************************/
    public LinkedList<Integer> findByNumber(String courseNumber, Database targetDatabase) throws NoSuchFieldException
    {
        String buffer = ""; // Out buffer
        LinkedList<Integer> returnList = new LinkedList<Integer>();

        // Search given database for a matching string
        for(int index=0; index<targetDatabase.getArraySize(); index++)
        {
            int numCourses = targetDatabase.get(index).size();
            // Loop courses
```

```
82              for(int index2=0;index2<numCourses;index2++)
83              {
84                  if(targetDatabase.getArrayPosition(index,index2).getCourseNumber().
85                          toLowerCase().equals(courseNumber.toLowerCase()))
86                  {
87                      // Add the class attributes to the buffer
88                      buffer += targetDatabase.getArrayPosition(index,index2).
89                                  getCourseNumber() + ": " +
90                                targetDatabase.getArrayPosition(index,index2).
91                                    getCourseTitle()  + " (" +
92                                targetDatabase.getArrayPosition(index,index2).
93                                    getCreditCount()  + "). "+
94                                targetDatabase.getArrayPosition(index,index2).
95                                    getTermTaken()     + " "  +
96                                targetDatabase.getArrayPosition(index,index2).
97                                    getYearTaken()     + " "  +
98                                targetDatabase.getArrayPosition(index,index2).
99                                    getCourseGrade()  + "\n"    ;
100                     returnList.addLast(index);  // first index
101                     returnList.addLast(index2); // second index
102                 }
103             }
104         }
105         if(!buffer.equals(""))
106         {
107             System.out.println("Results:");
108             System.out.println(buffer);
109             buffer = ""; // clear buffer
110             return returnList;
111         }
112         // Throw exception as no match was found
113         else{throw new NoSuchFieldException();}
114     }
115 }
```