**Psuedocode**

Start program

Void menu

1. Load Data Structure
2. Print Course List
3. Print Course
4. Exit

Create data types Course

Course number: course name

Void load data structure

Read file which contains list of courses

Void print course list

Organize list of courses by course number

Print list of courses

Exit program

**Run-Time and memory analysis**

| **Code** | **Line Cost** | **# Times Executes** | **Total Cost** |
| --- | --- | --- | --- |
| **for all courses** | 1 | n | n |
| **if the course is the same as courseNumber** | 1 | n | n |
| **print out the course information** | 1 | 1 | 1 |
| **for each prerequisite of the course** | 1 | n | n |
| **print the prerequisite course information** | 1 | n | n |
| **Total Cost** | | | 4n + 1 |
| **Runtime** | | | O(n) |

**Evaluation and Recommendation**

There are three types of data structures that can be used for ABCU’s Computer Science department code which include vector, hash table, and binary search tree. Vector fast and easier to program. Hash table is the most difficult to program, and binary search tree is the fastest as well. My recommendation for ABCU is vector because of it’s ease of programming and it’s speed.