Pseudocode to define how the program opens the file, reads the data from the file, parses each line, and checks for file format errors.

Function LoadCourses(filename):

Open file with name filename

If file cannot be opened:

Print "Error: Unable to open file."

Return

Initialize empty hashTable

Initialize empty courseList

While not end of file:

Read line from file

Split line into tokens using comma as delimiter

If number of tokens < 2:

Print "Error: Invalid format in line:", line

Continue

Assign first token to courseNumber

Assign second token to courseTitle

Assign remaining tokens (if any) to prerequisites

Create Course object with courseNumber, courseTitle, and prerequisites

Store Course object in hashTable with key as courseNumber

Append courseNumber to courseList

Close file

Return hashTable, courseList

End Function

Function ValidateCourses(hashTable, courseList):

For each course in hashTable:

For each prerequisite in course.prerequisites:

If prerequisite is not in hashTable:

Print "Error: Prerequisite", prerequisite, "not found in course list."

End Function

Function PrintCourses(hashTable):

Sort course keys in hashTable

For each courseNumber in sorted order:

Retrieve course from hashTable using courseNumber

Print "Course:", course.courseNumber, course.courseTitle

If course.prerequisites is not empty:

Print "Prerequisites:"

For each prerequisite in course.prerequisites:

Print " -", prerequisite

Else:

Print "Prerequisites: None"

End Function

Function PrintCourseInfo(hashTable, courseNumber):

If courseNumber exists in hashTable:

Retrieve course from hashTable using courseNumber

Print "Course:", course.courseNumber, course.courseTitle

If course.prerequisites is not empty:

Print "Prerequisites:"

For each prerequisite in course.prerequisites:

Print " -", prerequisite

Else:

Print "Prerequisites: None"

Else:

Print "Course not found."

End Function

Function Main():

filename = "courses.txt"

hashTable, courseList = LoadCourses(filename)

ValidateCourses(hashTable, courseList)

Print "Course Information:"

PrintCourses(hashTable)

Prompt user for a course number to look up

Read user input as searchCourseNumber

PrintCourseInfo(hashTable, searchCourseNumber)

End Function