# CS 300 5-3 Project One Milestone Three: Tree Data Structure Pseudocode

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**Pseudocode**

Class Course

course\_number

title

prerequisites (list)

EndClass

Class Node

course (Course object)

left (Node)

right (Node)

EndClass

Class BinarySearchTree

root (Node)

Function Insert(course)

If root is null

root = new Node(course)

Else

addNode(root, course)

EndIf

EndFunction

Function addNode(node, course)

If course.course\_number < node.course.course\_number

If node.left is null

node.left = new Node(course)

Else

addNode(node.left, course)

EndIf

Else

If node.right is null

node.right = new Node(course)

Else

addNode(node.right, course)

EndIf

EndIf

EndFunction

EndClass

Function LoadCourses(file\_path)

Open file at file\_path

If file cannot be opened

Print error message and return

EndIf

Initialize an empty BinarySearchTree bst

Initialize a list of course numbers course\_list

While there are lines to read in the file

Read line

Split line by commas into tokens

If the number of tokens < 2

Print error message and continue to next line

EndIf

Create a new Course object

Set Course.course\_number to tokens[0]

Set Course.title to tokens[1]

Initialize an empty list prerequisites

For each token from tokens[2] to end of tokens

Add token to prerequisites

EndFor

Set Course.prerequisites to prerequisites

Add Course.course\_number to course\_list

bst.Insert(Course)

EndWhile

For each Course in bst

For each prerequisite in Course.prerequisites

If prerequisite not in course\_list

Print error message about missing prerequisite

EndIf

EndFor

EndFor

EndFunction

Function PrintCourseInfo(course)

Print "Course Number: " + course.course\_number

Print "Title: " + course.title

If course.prerequisites is not empty

Print "Prerequisites: " + join(course.prerequisites, ", ")

Else

Print "Prerequisites: None"

EndIf

EndFunction

Function InOrderTraversal(node)

If node is not null

InOrderTraversal(node.left)

PrintCourseInfo(node.course)

InOrderTraversal(node.right)

EndIf

EndFunction

Function PrintAllCourses(bst)

InOrderTraversal(bst.root)

EndFunction

Function Main()

Set file\_path to "path/to/course\_file.csv"

LoadCourses(file\_path)

PrintAllCourses(bst)

EndFunction