**COMP 203 Data Structures and Algorithms, Fall 2024**

**Lab Assignment 10**

**Deadline: 16.12.2024 11:00 am**

**Read the questions and rules carefully. They are clear and well defined.**

**Rules:**

1. **No Cheating:** You are not allowed to collaborate with your friends and use any kind of websites or AI. If your homework gives a sign of any of them, **directly it will be graded as zero**.
2. **Goal:** Please do your homework alone. Our main aim is to **learn**.
3. **Submission:** Submit your work in **one java files.** **DON’T USE ZIP/RAR etc. In these cases, your points will be deducted by 30%.**
4. **Coding policy:** Explain your code in comments. **This is a must!**
5. **Latency policy:** A 30% deduction will be applied for each day of late submission.

**Files to submit:** BinarySearchTree.java

1. Implement Binary Search Tree abstract data structure from Node data structure. **(100pt)**

a. Implement a Node class with *int* data type (for Binary Search Tree) and Binary Search Tree class and their constructors in java. (5x2=10pt)

b. Implement Node Insert(Node root, int element) to insert the node having value *element* in the Binary Search Tree. You may assume that the *element* is not present in the BST. (15pt)

c. Implement Node Delete (Node root, int element) to remove the node having value *element* in the Binary Search Tree. You may assume that the *element* is present in the BST. (15pt)

d. Implement a Boolean isBST(Node root) to check if the given tree is a BST or not. If it is BST returns true, else returns false. (15pt)

e. Implement a void inOrderTraversal(Node root) to traverse the BST inorder manner. (15pt)

f. Create the following binary tree. (15pt)

g. Test all your functions in the main. (15pt)

