**Data structures and algorithms (3rd semester)**

1. What is data structure?
2. Classification of data structures
3. Asymptotic notation
4. Linked list
   1. Singly linked list
   2. Doubly linked list
   3. Circular list
   4. Doubly circular linked list
5. Stack
   1. Stack using array
   2. Stack using linked list
   3. Infix to postfix conversion
   4. Parenthesis matching
6. Queue
   1. Queue using array
   2. Queue using linked list
   3. Infix to prefix conversion
7. Circular queue
8. Tree
   1. Different terminology
   2. Binary tree
      1. Almost complete binary tree
      2. Strict binary tree
      3. Complete binary tree
      4. Tree traversal
         1. Inorder traversal
         2. Preorder traversal
         3. Postorder traversal
9. Properties of binary tree and proof
10. Binary search tree
    1. Definition
    2. Search
    3. Insert
    4. Delete
11. Threaded binary tree
12. AVL tree and rotations
13. Hashing
    1. Introduction
    2. Hash functions
       1. Division
       2. Mid-square
       3. Folding
14. Graph
    1. Definition
    2. Traversal
       1. Breadth-first search (BFS)
       2. Depth-first search (DFS)
15. Searching
    1. Linear search
    2. Binary search
16. Sorting
    1. Bubble sort
    2. Insertion sort
    3. Selection sort
    4. Quick sort
    5. Merge sort
    6. Count sort