Programme:

1. Review of concepts
   - Computational Models
   - Analysis of an algorithm
   - Cost analysis (time, space, etc)
   - Lower bound of a problem
   - Examples: search in a sorted array, input/output

   - Function Growing and Asymptotic Notation
   - Recurrence relations: asymptotic and exact solutions

3. Design of algorithms by induction
   - Mathematical Induction and Design of algorithms by induction
   - Design by Simple and by Strong Induction
   - Design by Divide-and-Conquer

4. Search, sorting and order statistics
   - Binary Search. Optional: Variations of Binary Search
   - Divide-and-conquer paradigm (mergesort, binary search, median)
   - Conquer may precede division (quicksort)
   - Average case analysis of quicksort
   - Computing the median and the k-th order statistics through quicksort partition
   - Linear worst-case algorithm for selecting the median and the k-th order statistics
   - Advantages of choosing a suitable data structure for the design of efficient algorithms
   - Lower bound for search in a sorted array, sorting, and median selection
   - Linear algorithms for sorting

5. Dynamic Programming
   - Description of the method
   - Applications of the method. Suggested examples:
     - Matrix chain multiplication
     - Longest Common Subsequence

6. Greedy Algorithms
   - Description of the method
   - Applications of the method. Suggested examples:
     - Activity-selection problem
- Huffman codes