Objectives:

1. To introduce the Selection Sort algorithm.
2. To introduce the Merge Sort algorithm.

Reading Assignment:

Neapolitan and Naimipour: Chapters 7.2-7.4.

Contents:

1. Outline Pseudocode for Selection Sort Algorithm. (1/2 hour)
2. Illustrate examples of Algorithm. (1/2 hour)
3. Lower Bounds for Algorithms. (1/2 hour)
4. Time Complexity. (1/2 hour)
5. Description of Merge Sort Algorithm. (1/2 hour)
6. Ways to Improve Merge Sort. (1/2 hour)
1. Outline Pseudocode for Selection Sort Algorithm. (1/2 hour)
   ```c
   void selectionsort(int n, keytype S[ ])
   {
       index i, j, smallest;
       for(i=1; i<=n; i++)
       {
           smallest = i;
           for(j=i+1; j<=n; j++)
               if(S[j]<S[smallest])
                   smallest = j;
           exchange S[i] and S[smallest];
       }
   }
   ```

2. Illustrate examples of Algorithm. (1/2 hour)

3. Lower Bounds for Algorithms. (1/2 hour)
   - Permutations.
   - Inversions in Permutation pairs.

4. Time Complexity. (1/2 hour)
   - Worst Case Analysis.
   - Average Case Analysis.

5. Description of Merge Sort Algorithm. (1/2 hour)
   - Explain concept behind approach.
   - Use diagram to sort and input in reverse order.

6. Ways to Improve Merge Sort. (1/2 hour)
   - Dynamic Programming version.
   - Linked Version.
   - More complex version.
Handouts, etc. for Lecture: None.