Objectives:

1. To introduce sorting algorithms through the presentation of Insertion Sort.
2. To introduce the Selection Sort algorithm.

Reading Assignment:

Neapolitan and Naimipour: Chapter 7.2.

Contents:

1. Definition of Insertion Sort. (1/4 hour)
2. Illustrate Examples of Insertion Sort. (1/2 hour)
3. Outline Algorithm with Pseudocode. (3/4 hour)
4. Time Complexity. (1/2 hour)
5. Selection Sort vs. Insertion Sort. (1/2 hour)
6. Illustrate Examples of Selection Sort. (1/2 hour)
1. Selection Sort Definition. (1/4 hour)
   - An algorithm that sorts by inserting records in an existing sorted array.

2. Illustrate Examples of Insertion Sort. (1/2 hour)

3. Outline Algorithm with Pseudocode. (3/4 hour)
   ```
   void insertionsort(int n, keytype S[ ])
   {
     index i, j;
     keytype x;
     for (i=2; i<=n; i++)
     {
       x = S[i];
       j = i-1;
       while(j >0 && S[j]>x)
       {
         S[j+1] = S[j];
         j--;
       }
       S[j+1] = x;
     }
   }
   ```

4. Insertion Sort Time Complexity. (1/2 hour)
   - Worst Case Analysis
   - Average Case Analysis
   - Analysis of Extra Space Usage

5. Selection Sort vs. Insertion Sort. (1/2 hour)
   - Comparison Keys
   - Time complexity
   - Performance

6. Illustrate Examples of Selection Sort. (1/2 hour)
Handouts, etc. for Lecture: None.