# Texas College of Management & IT

**Siphal , Kathmandu**

Subject : Fundamentals of Algorithm                    Total Class Hours: 45

IT IV SEM.                                             Tutor: Omkar Basnet

| S.N. | Description | Teaching Hours |
|---|---|---|
| 1. | • Introduction to algorithm <br> • Implementation issues(completeness, Time & space complexity, optimality, implementation issues with Data structure, errors and implementation of API) <br> • Analyzing Algorithms(scientific , mathematical, Theory of Algorithm) | 6 hrs. |
| 2. | Model of computation <br> • introduction and Types | 3 hrs. |
| 3. | • Analysis of Brute-Force Algorithm(Running time analysis) <br> • Analysis of Brute-Force Maxima Algorithm <br> • Introduction to plane sweep algorithm <br> • Comparison between plane sweep and Brute-Force Algorithm | 8 hrs. |
| 4. | Sorting techniques <br> • Analysis of Selection sort <br> • Divide and conquer Strategy (introduction) <br> • Quick and Merge Sort. <br> • Heap sorting | 8 hrs. |
| 5. | Graph <br> • Representation, Traversal <br> • Generic graph Traversal Algorithm , Analysis of BFS <br> • Greedy Approach(Counting Money and Huffman Encoding) <br> • Computing Minimum Spanning Tree(Generic and Greedy MST Approach) | 10 hrs. |
| 6. | Greedy Approaches of Graph Traversal <br> • Kruskal's algorithm <br> • Prim's Algorithm <br> • Dijkstra's Algorithm <br> • Bellman –Ford Algorithm | 10 hrs. |
| | Total | 45 hours. |

**References and Books:**

- Algorithm by Robert Sedgewick,Kevin Wayne , 4th Editon, 2011
- Introduction to algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest Clifford Stein 3rd edition, 2010.
- (*September 09, 2017*). Lecture slides that accompany *Algorithms, 4th Edition.* from https://algs4.cs.princeton.edu/lectures/
- (3 November 2012). Design and Analysis - Study Notes, Study notes for Digital Systems Design from https://www.docsity.com/en/users/profile/ankitay/documents/