**Texas College of Management & IT**

**Siphal , Kathmandu**

Subject : Fundamentals of Algorithm Total Class Hours: 45

IT IV SEM. Tutor: Omkar Basnet­­

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