**SARDAR PATEL UNIVERSITY**  
Programme: MCA  
Semester: III  
Syllabus with effect from: June 2014  

<table>
<thead>
<tr>
<th>Paper Code: PS03CMCA04</th>
<th>Total Credit: 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Of Paper: Analysis and Design of Algorithms</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Description in detail</th>
<th>Weighting (%)</th>
</tr>
</thead>
</table>
| 1    | **Review of Data Structures**  
Such as stacks, queues, linked lists, trees, graphs, heaps and sets along with important operations on it  
Concepts in algorithm analysis, asymptotic complexity |
| 2    | **Divide and Conquer**  
The general method  
Binary search, Finding maximum, minimum  
Merge sort, Quick sort  
Strassen's matrix multiplication |
| 3    | **Greedy method**  
General method  
Optimal storage in tape, Knap sack  
Job sequencing with deadlines  
Spanning trees, Shortest paths |
| 4    | **Dynamic Programming**  
General method  
Multistage graphs  
Optimal binary search trees  
0/1 knapsack, Travelling salesman problem |
| 5    | **Backtracking**  
General method  
8 queens problems, Graph colouring  
Hamiltonian cycles |
| 6    | **Branch & Bound**  
The method, LC Search, 15 puzzle  
Travelling salesman algorithm using branch & bound techniques |

**Basic Text & Reference Books**