**UE\_\_\_\_\_\_\_\_\_\_ - Fine Techniques(2:0:0:0:2)**

**# of Hours: 28**

|  |  |  |  |
| --- | --- | --- | --- |
| **Class #** | **Topics to be Covered** |  |  |
|  |  |  |  |
| 1 | Motivation for the course.  Introduction  Memory Management – garbage, dangling pointer, dereferencing dangling pointer- why it may not crash.  Hijacking malloc and free |  |  |
| 2 | Linked list with header node for ease of insertion.  Linked list with tailer node for ease of searching.  List in an array. |  |  |
| 3 | Project: Develop memory manager  Introduction to memory manager. Allocation Policy.  Book keeping. Deallocation and free list. |  |  |
| 4 | Bitwise wise  Store an int in bit  external sorting of unique integers using bits |  |  |
| 5 | binary counter |  |  |
| 6 | Project : find the second highest in n + log(n) – 2 comparisons with (log(n))^2 extra space |  |  |
| 7 | Arrays : challenging problems and efficient programs  Multiplication of 2D arrays – make this cache friendly |  |  |
| 8 | Arrays: sorting using an array of pointers to structures with callback |  |  |
| 9 | Kth partition and finding median without sorting |  |  |
| 10 | Lists and its variation : challenging problems and efficient programs  reverse, splice |  |  |
| 11 | Project: sorting of list in place |  |  |
| 12 | Trees: height balanced trees |  |  |
| 13 | General purpose Trees |  |  |
| 14 | Project : implement trees on the hard disk |  |  |

**Literature**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Book Type** | **Title & Author** | **Publication Information** | | |
| **Edition** | **Publisher** | **Year** |
| Text Books | The C programming Language – Dennis Ritchie and Brian Kernighan |  |  |  |
|  | Programming Pearls – Jon Bentley |  |  |  |
|  | More Programming Pearls – Jon Bentley |  |  |  |