**UE17CS251:**

**Fine Techniques**

**Course Objectives:**

The objective(s) of this course is to,

* Learn analysis of problems
* Learn developing various solutions for a given problem
* Learn selecting suitable algorithms and data structures
* Learn developing non-trivial large programs
* Learn testing programs for correctness and efficiency

**Course Outcomes:**

At the end of the course, the student will be able to:

* analyze a given problem
* propose various solutions
* evaluate the proposed solutions for time and space requirements
* implement the solution
* test and profile the programs

**Course Content:**

1. Memory Management – garbage, dangling pointer, dereferencing dangling pointer

- why it may not crash

Project: Develop memory manager – safe/unsafe efficient in space and/or time

1. Bitwise wise

Store an int in bit – external sorting of unique integers using bits

binary counter

Project : find the second highest in n + log(n) – 2 comparisons with (log(n))^2 extra space

1. Arrays : challenging problems and efficient programs

Project: defragmentation of blocks

1. Lists and its variation : challenging problems and efficient programs

Project: sort a list in place using binary counter

1. Trees: height balanced trees

Project : implement trees on the hard disk

Project : implement height balanced tree on the hard disk

**Pre-requisite Courses:** UE17CS151 – Problem Solving with C.

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**Reference Book(s):**

1. Programming Pearls, Second Edition, Jon Bentley, Pearson Education
2. More Programming Pearl, Jon Bentley, Pearson Education