CS 218: Design and Analysis of Algorithms

Instructor: Nutan Limaye

Introduction. The course is an introduction to the principles of design and analysis of algorithms. The course is being offered in the online mode.

Credit Structure Crediting/Auditing the course:

Credit The credit structure is likely to change slightly due to unpredictable nature of the online semester. Assuming that the course runs uneventfully, the course structure will be as follows.

assignments and related vivas	45%
mid-sem	15%
end-sem and related viva	30%
class participation*	10%

*Throughout the semester some specific activities will be tagged as "CP", which will be counted towards class participation.

Audit

The course will not be open for auditing. Please feel free to sit-through.

Course Outline

Module I *Basic techniques*

1. Greedy algorithms.
2. Divide and Conquer
3. Dynamic programming.

Module II *Combinatorial optimization*

1. Max-flow and min-cut.
2. Applications of max-flow and min-cut.
3. Optimization problems, LP formulation and duality.

Module III *NP: a roadblock for algorithm design?*

1. NP-completeness and reductions.

References

- Algorithm Design – Jon Klienberg, Eva Tardos.
- Algorithms – Jeff Erikson `http://jeffe.cs.illinois.edu/teaching/algorithms/#book`