

CSE525 Graduate Algorithms Lec0



Debajyoti Bera (M21)

Create an account on Google Classroom

Register for the course **CSE525 Graduate Algorithm**

(course code **2ybfjos**)

<https://sites.google.com/a/iitd.ac.in/cse525-m19>

Evaluation

- Large exams: $30+40\%$ (Midsem + Endsem exams) *Final*
- Short online tests/quizzes in class/tutorial : best 10 (of ~20) x 3% = 30% } *30%*
- Homework problems : 0%
- **Fail** if any of the above :
 - less than 33% in final exam }
○ less than 33% overall }
- Any kind of cheating during quizzes/exams: Refer to institute academic policy.

What will you learn?

1. Improve understanding of divide and conquer, ~~greedy~~ and dynamic programming techniques.
2. Advanced analysis and application of data structures like heaps, trees and graphs.
3. Understand concepts of NP-completeness and reductions.
4. Learn techniques like randomization, approximation, search, to handle intractable problems.

High level objective:

- Develop intuition about data structures and algorithms
- Develop formal understanding of computational problem
- Develop proper technique of algorithm design & analysis

What will you learn?

This course is an advanced form of an introductory algorithms course, and is meant to have a thorough grounding in core Algorithms required for pursuing PG degree in Computer Science. The course covers topics such as asymptotic notation, recurrence relation, graph algorithms, heaps, dynamic programming, greedy algorithms, divide & conquer, NP-completeness where the UG contents of each topic is first reviewed in a fast-paced manner, and is followed by some advanced content.

If no knowledge or insufficient knowledge of introductory algorithms, then this is not the proper course to register. Please sit-through ADA/CSE222 (Undergraduate algorithms) first.

If reasonable knowledge of introductory algorithms, then this is not the proper course to register. Please study MAD (Modern Algo. Design).

Topics

1. Recursive algorithms
2. Dynamic programming
3. Data structures
4. Graph algorithms
5. NP-completeness
6. Approximation algorithms

} <UG
syll.

Not covered

Greedy algorithms

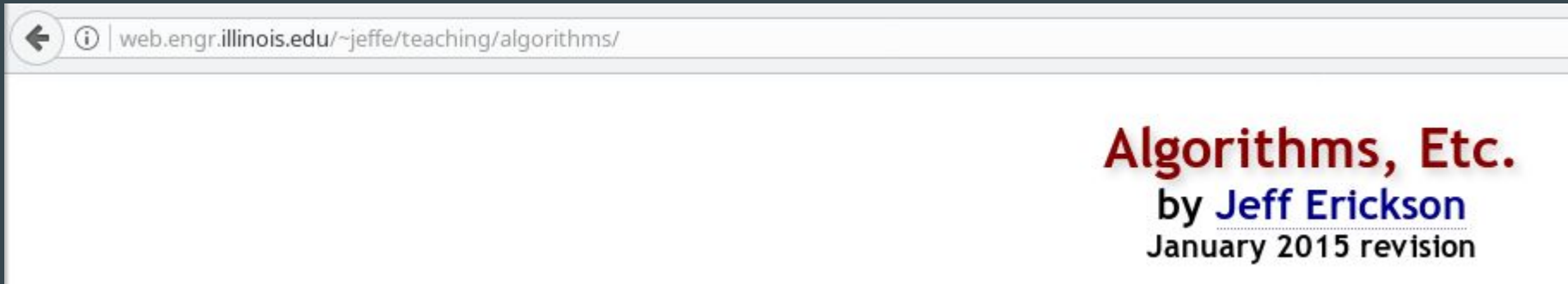
Randomized Algo.

Enough data structures

Resources

Textbook: Online lecture notes by Jeff Erickson

<http://web.engr.illinois.edu/~jeffe/teaching/algorithms/>



<https://courses.engr.illinois.edu/cs374/sp2018/A/schedule.html> CS374 Spring 2018

<https://courses.engr.illinois.edu/cs473/sp2017/lectures.html> CS473 Spring 2017

Homeworks

- Objective is not about solving a problem or finding the solution to a problem
- Objective is to practice “how to approach, solve and write a correct answer of a particular type of problem”
- 1-2 problems per lecture, 3-4 days to solve them.
 - Each question should require at the max 2-3 hours if solved on your own. | form groups
- Homeworks are ungraded. We don't care if you do not solve them. But if you do, we will verify your solution with utmost sincerity.

Additional help

Teaching Assistant:

Suryendu Dalal (PhD student in algorithm design)
+ 3 more

TA/Instructor office hours

TBA

Tutorial (optional)

Discussion of lecture concepts + problem solving