Welcome to CS 234

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• http://www.cs.ucr.edu/~stelo/
  (click on “Teaching”, then CS 144 Fall 22)
CS 234 Course Format

• 3 Homework
• 1 Midterm
• 1 Presentation or Report
• 1 Project

CS 234 grading

• Homework (3): 15%
• Midterm: 25%
• Presentation (20 minutes, last two weeks) or written report: 25%
• Project: 35% (due final week, ½ hour demo over zoom)
CS 234 Course Overview

• Intro to Molecular biology (DNA/RNA/proteins, replication, transcription, translation, ...)  
• Intro to Molecular biology tools (hybridization, digestion, PCR, sequencing, ...)  
• String matching (exact and approximate)  
• Data structures for exact string matching (hashing, Bloom filters, suffix trees/arrays, BWT)  
• Probability and Statistics (parameter estimation, Bernoulli and Markov models, Bayes theorem, entropy)  
• Position-specific matrix profiles (relative entropy), hidden Markov models (Viterbi, Baum-Welch), profile HMM  
• Biological networks (co-expression networks, gene regulatory network, protein-protein interaction networks, metabolic networks, analysis of networks, random models)

What you will not learn here...

• Molecular biology (if you are really interested in Molecular biology, you should enroll/audit an undergraduate course in molecular biology, e.g., BIOL 107A/B)  
• Statistics (same considerations ... consider STAT160A-B, STAT161)  
• How to use existing bioinformatics software for molecular biology
If you want to know more about ...

- Algorithms for multiple sequence alignment (local and global)
- Algorithms for fragment assembly
- Algorithms for restriction mapping and multiple digest mapping
- Algorithms for phylogenetic trees reconstruction
  ... and more
- “CS 144: Algorithms for Bioinformatics” (Spring quarter, Stefano)
- “CS 238: Algorithms for Molecular Biology” (Spring quarter, Ming)
To know more about molecular biology


Bioinformatics (references)


Bioinformatics (references)


Bioinformatics (sequences/probability)


Introduce yourself

- Name
- Department
- PhD/MS/undergraduate (what major)
- Years at UCR
- Research interests