

時間: MON 1:20 PM – 4:05 PM

地點: 管412

Office Hours: MON 8:20 – 11:59 AM

教師: 林耀鈴 (<http://www.cs.pu.edu.tw/~yawlin>)

辦公室: 管417 (右門)

電話: 2632-8001 ext 13403

Bioinformatics is an interdisciplinary field that uses computational approaches to answer biological and biochemical questions. This course is designed to discuss algorithms for some important computational problems in Molecular Biology, especially in analyzing and classification of genomes, genes, gene products/proteins, and functions. We shall study exact algorithms for those problems which can be solved efficiently, as well as complexity, approximation algorithms and heuristics for the more difficult problems. We shall concentrate on discrete realistic models for the biological problems. Many biological examples will be presented.

**參考書:**

- (1) Dan Gusfield, *Algorithms on Strings, Trees, and Sequences — Computer Science and Computational Biology*, Cambridge University Press, 1997.
- (2) Pavel A. Pevzner, *Computational Molecular Biology — An Algorithmic Approach*, MIT Press, 2000.
- (3) R. Durbin, S. Eddy, A. Krough, and G. Mitchison. *Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids*. Cambridge University Press, 1998.

**評分標準:** Grades will be assigned based on the following formula, with cut-offs determined by my opinion of students on the boundary.

Two Homeworks — 30%

Midterm Take Home — 30%

Final Take Home Exam — 40%

**課程進度概要:**

日期	主題	章節	Note
----	----	----	----
02/17	Introductory Concepts		
02/24	Exact String Matching	G2-4	
03/03	Least Common Ancestor	G8	
03/10	Suffix Trees 1	G5	
03/17	Suffix Trees 2	G6	
03/24	Applications of Suffix Trees	G7-9	
03/31	春假		
04/07	Sequence Alignment	G11-13,D2	
04/14	期中考		Midterm In
04/21	Multiple Sequence Alignment	G14,P7,D6	
04/28	Hidden Markov Models	D3	
05/05	Phylogeny 1	D7	
05/12	Phylogeny 2	D8	
05/19	Genome Rearrangement	P10	
05/26	Structural Bioinformatics 1		
06/02	Structural Bioinformatics 2		
06/09	期末考		Final In