CS4330: Combinatorial Methods in Bioinformatics

Course Briefing

Wong Limsoon
Pre-requisites

Completed modules on

Programming

Algorithms

Basic molecular biology

ST2334 Probability & Statistics

CS2220 Introduction to Computational Biology
Objective

Exposure to computational methods for genome sequencing, assembly, and analysis
About me

Wong Limsoon

Professor in Computing & Medicine
ACM Fellow

Research interests

*Database theory:* Intensional expressive power
*Computational biology:* Batch effects
*Data science:* Justifiability, mistakes
Time Table

Lecture

*Thursday @ 2-4pm*

*COM3-02-60*

Office hours

*Friday @ 2-3.30pm, except 9 Feb, 1 Mar, 29 Mar*

*COM2-03-57*

Email

*wongls@comp.nus.edu.sg*
Course Syllabus

Overview of genome sequencing & assembly
Read mapping
Reference-based genome assembly
De novo genome assembly
Quality of genome assembly
Polyploid genome assembly
Long-read & hybrid genome assembly
Variant calling
Teaching Style

Need to learn a lot of material by yourself

*Reading papers*

*Consult “AI” … but beware that they are like “B students”*

*Try exercises*

*Practise on your own*

Don’t expect to be told everything
Assignments, Project, & Exam

Assignments (30-40% of marks)
2 to 3 assignments

Project (20-30% of marks)
Based on a case study in the class
8-10 pages of report / ppt slides expected

Exam (40-50% of marks)
1 final open-book exam
Be Honest

Exam

*Absence w/o good cause results in ZERO mark*

*Cheating results in ZERO mark*

Discussion on assignments & project is allowed

Blatant plagiarism is not allowed

*Offenders get ZERO mark for assignment or exam, for those who copied AND those who were copied*

SOC’s academic honesty guidelines

https://www.comp.nus.edu.sg/cug/plagiarism/
Background Readings

Every lecture will be accompanied by a small set of “must-read” and “good-to-read” articles.

The “must-read” articles are considered lecture notes and are examinable.