

PB lecture notes

Practical Bioinformatics

These are the notes for practical bioinformatics course. The professor says it'll be a heavy course, let's see about that. I am using Obsidian and this is an amazing markdown editor! It has a lot of community plugins. Anyways, study now... xD

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1. PB/Lecture 1 : Introduction to the course and grading.
2. PB/Lecture 2 : Something more here

Lecture one!

So, today was the first class of PB. The course structure is scary enough. For a CSE student, as recommended by the prof., a maximum of 10 hours is required dedicated to this course per week. To give a general overview, the topics are pretty cool, we will be covering genome sequencing and matching (a lot of data science). The recommended language is R, however, python is not a problem. A good databank is *nextstrain*. Visit [nextstrain/ncov](https://nextstrain.org/) for data on COVID-19.

Learning Objectives

At the end of the course, "I" shall be able to

1. use existing databases to solve Bioinformatics basis of diseases
2. use available toolkits and R packages for Bioinformatics pipelines
3. create new methods and tools for Bioinformatics
4. implement machine learning and artificial intelligence methods for Precision Health Informatics

Evaluation Rubric and reference

- Midsem : 20%
- Assignments and Quizzes : 40%
- Endsem : 30%
- Project presentation : 10%
- Textbook : Bioinformatics and Functional Genomics (Jonathan Pevsner, Wiley Blackwell).
- Reference : Bioinformatics for Omics Data Methods and Protocols (Bernd Mayer (Editor), Methods in Molecular Biology, Springer Protocols)

A big picture of the course

1. Databases
2. Alignment
3. Genomic Bioinformatics
4. Structural Bioinformatics
5. Evolutionary Bioinformatics

Lecture two!

'Omes'	Description
Genome	The full complement of genetic information both coding and noncoding in an organism
Proteome	The complete set of proteins expressed by the genome in an organism
Transcriptome	The population of mRNA transcripts in the cell, weighted by their expression levels as transcripts copy number
Metabolome	The quantitative complement of all the small molecules present in a cell in a specific physiological state
Interactome	Product of interactions between all macromolecules in a cell
Phenome	Qualitative identification of the form and function derived from genes, but lacking a quantitative, integrative definition
Glycome	The population of carbohydrate molecules in the cell
Translatome	The population of mRNA transcripts in the cell, weighted by their expression levels as protein products
Regulome	Genome wide regulatory network of the cell
Operome	The characterization of proteins with unknown biological function
Synthetome	The population of the synthetic gene products
Hypothome	Interactome of hypothetical proteins

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