SEMESTER 1
LSM2241 INTRODUCTORY BIOINFORMATICS

Module coordinator and lecturer	Prof. Greg TUCKER-KELLOGG dbsgtk@nus.edu.sg 6516 4740
Workload	24 lecture hours, 22 laboratory hours
Format	Blended learning with on-line material

Prerequisite: **LSM1102 or LSM1105 or LSM1106 or PR1111A**

1 Module Description

Students will be introduced to the concepts, tools and techniques of bioinformatics, a field of immense importance for understanding molecular evolution, individualised medicine, and data-intensive biology. The module includes a conceptual framework for modern bioinformatics, an introduction to key bioinformatics topics such as databases and software, sequence analysis, pairwise alignment, multiple sequence alignment, sequence database searches, and profile-based methods, molecular phylogenetics, genomic analysis and personal genomics. Concepts emphasised in the lectures are complemented by hands-on inquiry using bioinformatics tools in the practical sessions. Students will achieve highly valued skills as biological researchers with basic competence in computational and bioinformatics techniques, with an option to learn more advanced skills in upper level modules.

Module learning units

Unit	Topics	Lecture hours	Practical hours
1	Introduction, biological databases and bioinformatics software	4	4
2	Pairwise alignments	4	2
3	Searching sequence databases	4	4
4	Multiple sequence alignments and databases	4	2
5	Introductory molecular phylogenetics	4	4
6	Genome browsers and personal genomics	4	2
	Assignment work	0	4
	Total	24	22

Module assessment

Component	Assessment	Percentage
Inquiry-based assignment	written report	30
Mid-term test	short answer mid-term test	20
Participation	Forum and practical participation	10
Final Exam	Mixture of short and long answer test	40
Total		100

2 Texts

Bioinformatics and Functional Genomics Jonathan Pevsner. Wiley-Blackwell (3nd ed., 2015). This module draws heavily from the first third of the book. *This book is highly recommended*

Practical Bioinformatics Michael Agostino. Garland Science 2013. This is an easier, very practical introduction to bioinformatics. The theory is quite limited, but the practical guidance is good.

I will provide literature references throughout the semester.

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