

## TIGP Bio 2022 Fall Syllabus

### Biological Computing (C1)

For the latest syllabus, please visit the BP website: <https://tigbp.iis.sinica.edu.tw>

**Place:** Room 107, New Building of the Institute of Information Science, Academia Sinica.

**Time:** Friday 14:00-17:00

**Chair:** Dr. Huai-Kuang Tsai (hksai@iis.sinica.edu.tw)

**Aim:** The aim of the course is to link issues in computer science to biology and thus capture the interest of students in both areas. It is expected that students will acquire and retain important knowledge about computational biology

**Outline:** The course provides an introduction to the basic computational concepts and methods used in molecular biology and genetics. It covers classic algorithmic techniques (for examples: divide and conquer algorithm, dynamic programming ...), data structures (e.g. queue, tree...), and common computational problems in biology (such as motif finding, sequence alignment ...). In addition, Bioinformatics approaches for next generation sequencing and the most up-to-date technology will be addressed as well.

**Textbook/Reference book:** N/A

**TA:** Po-Yuan Chen      **Email:** shepherd71c@gmail.com

**Office hours:** Tuesday 16:00-18:00 pm    **Office location:** Room N802, Institute of Biomedical Sciences, Academia Sinica

**Grades:** Midterm exam 50%. Final exam 50%.

#### 【 For Non-BP student 】

For Non-BP student to register/sit-in any BP course, it is required to gain course chair's permission:

- (1) Basic Enrollment Information form (<http://bit.ly/3g22mfl>)
- (2) TIGP-BP Course Registration Consent Form (<http://bit.ly/3ub12Bs>)

※ Deadline: **the 4th week** of each semester.

※ Signature of the course chair should be collected before submission. Incomplete form will not be accepted.

※ Course grade will NOT be given (even class enrollment is completed at school) if fail to follow the above procedures.

Week	Date	Topics/Brief Description	Lecturers	Evaluation Method:
1	2022/9/7	Rescheduled to 2022/9/16	--	--
1	2022/9/9	Holiday-Mid-Autumn Festival (no class)	--	--
2	<a href="#">2022/9/16</a> <a href="#">@Webex Only</a>	Analysis of Algorithms	Dr. Jia-Ming Chang	in-class exam on midterm exam date
2	<a href="#">2022/9/19</a> <a href="#">(Mon) 14-17 PM</a> <a href="#">@Webex Only</a>	Recurrence	Dr. Jia-Ming Chang	
3	<a href="#">2022/9/30</a> <a href="#">@Webex Only</a>	Introduction to Data Structure (I)	Dr. Yu-Jung Chang	in-class exam on midterm exam date
4	<a href="#">2022/10/04</a> <a href="#">(Tues) 14-17 PM</a> <a href="#">@Webex Only</a>	Introduction to Data Structure (II)	Dr. Yu-Jung Chang	
5	<a href="#">2022/10/7</a> <a href="#">@Webex Only</a>	Algorithmic Techniques	Dr. Chen-Ching Lin	HW with a specified deadline ► <a href="#">Nov. 4th</a>
6	2022/10/14	Sequence alignment	Dr. Huai-Kuang Tsai	HW with a specified deadline ► <a href="#">Nov. 14th</a>
7	2022/10/21	Review week (no class)	--	--
8	2022/10/28	Midterm Exam	--	--
9	2022/11/4	Databases: An Overview	Dr. Kai-Chun Liu	HW with a specified deadline ► <a href="#">Dec. 23rd</a>
10	2022/11/11	Introduction to Data Mining	Dr. Kai-Chun Liu	
12	<a href="#">2022/11/23 (Wed)</a> <a href="#">14-17 PM</a>	Fundamentals of Molecular Evolution and Phylogenetic Tree Construction	Dr. Jinn-Jy Lin	HW with a specified deadline ► <a href="#">Dec. 23rd</a>
12	2022/11/25	The Analysis of Next Generation Sequencing Data	Dr. Hsin-Nan Lin	in-class exam on final exam date
13	2022/12/2	Structural Bioinformatics	Dr. Chen-Hsin Yu	HW with a specified deadline ► <a href="#">Dec. 30th</a>
14	<a href="#">2022/12/7 (Wed)</a> <a href="#">14-17 PM</a> <a href="#">@N101</a>	Computational Proteomics	Dr. Ching-Tai Chen	in-class exam on final exam date
15	2022/12/16	Review Week (no class)	--	--
16	2022/12/23	Final Exam	--	--
17	2022/12/30	Computational Epigenetics	Dr. Chen-Hsin Yu	no exam