

TIGP Bioinformatics Program

Advanced Algorithms (C2)

Spring 2026 Syllabus

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

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| <p>Place: Room 308, Institute of Statistical Science, Academia Sinica</p> <p>Time: Friday 14:00-17:00</p> <p>Chair: Dr. Li Su (lisu@iis.sinica.edu.tw)</p> <p>Co-Chair: Dr. Trees-Juen Chuang (trees@gate.sinica.edu.tw)</p> <p>Outline: This course is basically about data mining, machine learning and statistical modeling from data, and some other algorithms and applications.</p> <p>Resources: There are 7 topics given in the way of Videos Preview (about 2~3 hours) + In-class discussions (about 1~1.5 hours). Please find the link (https://reurl.cc/eGWkoL) that WILL provide the links of the following: (1) the videos to be watched BEFORE the class (2) the questions to be discussed IN the class (3) the homework to be completed AFTER the class</p> <p>References: 1. Learning from Data- A Short Course (Abu-Mostafa, Magdon-Ismael, Lin, 2012) 2. Learning Pattern Classification (Duda, Harg, and Stork, 2001) 3. An Introduction to Support Vector Machines and Other Kernel-based Learning Methods (Cristianini and Shawe-Taylor, 2000) 4. [DL in Life Science] https://mit6874.github.io/ 5. [ML for Genomics] https://www.classcentral.com/course/youtube-6-047-6-878-machine-learning-for-genomics-fall-2020-48203</p> <p>TA: N/A (Please refer to the lectures respectively shall you have any questions for each class)</p> <p>Grades: Midterm exam 50%. Final exam 50%.</p> <p style="text-align: center;">【 For Non-BP student 】</p> <p>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 https://forms.gle/oK7vJzrx9EvybbT9 (2) TIGP-BP Course Registration Consent Form https://idv.sinica.edu.tw/tigpbio/index/TIGP%20Bioinformatics_Class%20Registration%20Consent%20Form.docx</p> <p>※ 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.</p> |
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| Week | Date | Topics/Brief Description | Lecturers | Lecture Style | Evaluation Method | Email |
|------|---|--|--------------------------|--|--|------------------------------|
| 1 | 2026/2/25 (Wed) 14:00-17:00 | Data Classification | Dr. Li Su | Lectures | Take-home exam with a specified deadline: ▶ 2026/3/11 | lisu@iis.sinica.edu.tw |
| 1 | 2026/2/27 | Class rescheduled to 2/25. Make-up Holiday for 228 Peace Memorial Day (no class) | -- | -- | -- | -- |
| 2 | 2026/3/6 | Convolutional Neural Networks, Recurrent Neural Networks (optional: Graph Neural Networks) | Dr. Li Su | Preview videos + in-class discussions | Take-home exam with a specified deadline: ▶ 2026/3/20 | chelin@ntu.edu.tw |
| 3 | 2026/3/13 | Hidden Markov Models | Dr. Yu Tsao | Lectures | In-class exam on midterm exam date | yu.tsao@citi.sinica.edu.tw |
| 4 | 2026/3/20 | [DL in Life Science] GWAS and Variants | Dr. Amrita Chattopadhyay | Preview videos + in-class discussions | Take-home exam with a specified deadline: ▶ 2026/4/11 | amrita@ntu.edu.tw |
| 5 | 2026/3/23 (Mon) 14:00-17:00 @Google Meet Only | Boolean and Bayesian networks | Dr. Henry Horng-Shing Lu | Online lectures | Take-home exam with a specified deadline: ▶ 2026/4/23 | henryshlu@nycu.edu.tw |
| 5 | 2026/3/27 | Class rescheduled to 3/23. | -- | -- | -- | -- |
| 6 | 2026/4/1 (Wed) 14:00-17:00 | Single cell RNA-seq | Dr. Yao-Ming Chang | Preview videos + in-class discussions | In-class exam on midterm exam date | petitming@ibms.sinica.edu.tw |
| 6 | 2026/4/3 | Class rescheduled to 4/1. Make-up Holiday for Tomb-Sweeping Day and Children's day (no class) | -- | -- | -- | -- |
| 7 | 2026/4/10 | Review Week (no class) | -- | -- | -- | -- |
| 8 | 2026/4/17 | Midterm Exam | -- | -- | -- | -- |
| 9 | 2025/4/24 @Google Meet Only | Network Analysis | Dr. Hsuan-Cheng Huang | Online lectures | Take-home exam with a specified deadline. | hsuancheng@nycu.edu.tw |
| 10 | 2026/5/1 | Class rescheduled to 5/4. Holiday: International Workers' Day | -- | -- | -- | -- |
| 11 | 2026/5/4 (Mon) 14:00-17:00 | [DL in Life Science] Graph Analysis [DL in Life Science] Drug Discovery | Dr. Yueh-Hua Tu | Preview videos + in-class discussions | TBA (was take-home exam with a specified deadline) | a504082002@gmail.com |
| 11 | 2026/5/6 (Wed) 14:00-17:00 | [DL in Life Science] Protein Structure Prediction | Dr. Chien-Yu Chen | Preview videos + in-class discussions | Take-home exam with a specified deadline. | chienyuchen@ntu.edu.tw |
| 11 | 2026/5/8 | Class rescheduled to 5/6. | -- | -- | -- | -- |
| 12 | 2026/5/12 (Tues) 14:00-17:00 | Advanced Algorithms for Proteomics | Dr. Ching-Tai Chen | Preview videos + in-class discussions | Take-home exam with a specified deadline. | ctchen@utapei.edu.tw |
| 12 | 2026/5/15 | Class rescheduled to 5/12. | -- | -- | -- | -- |
| 13 | 2026/5/19 (Tues) 14:00-17:00 | Exploring modeling in enzyme kinetics and pharmacokinetics | Dr. An-Chi Wei | Lectures | Take-home exam with a specified deadline: ▶ 2026/6/12 | acwei86@ntu.edu.tw |
| 13 | 2026/5/22 | Class rescheduled to 5/19. | -- | -- | -- | -- |
| 14 | 2026/5/29 @Google Meet Only | Systems Biology and Biological Modeling of Gene Regulation | Dr. Yu-Chao Wang | Preview videos + <u>Online</u> discussions | Take-home exam with a specified deadline: ▶ 2026/6/12 | yuchao@nycu.edu.tw |
| 15 | 2026/6/5 | Review Week (no class) | -- | -- | -- | -- |
| 16 | 2026/6/12 | Final Exam | -- | -- | -- | -- |