TIGP Bioinformatics Program
Basic Molecular Biology I (B1)
Fall 2025 Syllabus

Latest syllabus: https://idv.sinica.edu.tw/tigpbio/

Place: Room 308, Institute of Statistical Science, Academia Sinica

Time: Tuesday 09:00-12:00

Chair: Dr. Ho-Ming Chen (homing@gate.sinica.edu.tw)

Aim: Understanding the key concepts in molecular and cell biology and their experimental underpinnings

Textbook: (Required)
1. Molecular Cell Biology, 7th edition, by Harvey Lodish et al. Publisher: W. H. Freeman. International Edition (13 Aug, 2012). ISBN-13: 9781464109812.
Local book store: http://www.yihsient.com.tw/front/bin/ptdetail.phtml?Part=06585
Reference: (Recommended but not required)
2. Molecular Biology of the Cell, 6th edition, 2014.
http://www.yihsient.com.tw/front/bin/ptdetail.phtml?Part=06595&Rcg=53601
3. Molecular Biology: Principles of Genome Function, 2nd edition, 2014.
http://www.yihsient.com.tw/front/bin/ptdetail.phtml?Part=06594&Rcg=52559
4. Biochemistry: A Short Course, 2nd edition, by Lubert Stryer et al. Publisher: W. H. Freeman (December 23, 2011). ISBN-10: 1429283602, ISBN-13: 978-1429283601.

TA: N/A (Please refer to the lectures respectively shall you have any questions for each class)

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 https://forms.gle/oK7vJzzrx9Evybb19
(2) TIGP-BP Course Registration Consent Form
https://idv.sinica.edu.tw/tigpbio/index/TIGP%20Bioinformatics_Class%20Registration%20Consent%20Form.docx
※ 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	Email
1	2025/9/2 Online Only	Molecules, Cells, and Evolution	Dr. Ueng-Cheng Yang	Take-home exam with a specified deadline: ▶ 2025/9/8	uyang@nycu.edu.tw
2	2025/9/9 Online Only	Basic Molecular Genetic Mechanisms	Dr. Ueng-Cheng Yang	Take-home exam with a specified deadline: ▶ 2025/9/15	
3	2025/9/16 Online Only	Molecular Genetic Techniques	Dr. Ueng-Cheng Yang	Take-home exam with a specified deadline: ▶ 2025/9/22	
4	2025/9/23	Genes, Genomics, and Chromosomes	Dr. Liang-Chuan Lai	Take-home exam with a specified deadline: ▶ 2025/10/21	llai@ntu.edu.tw
5	2025/9/30	Transcriptional Control of Gene Expression	Dr. Chuan Ku	Take-home exam with a specified deadline: ▶ 2025/10/7	chuanku@gate.sinica.edu.tw
6	2025/10/7	Protein Structure and Function	Dr. Lay-Sun Ma	Take-home exam with a specified deadline: ▶ 2025/10/31	laysunma@gate.sinica.edu.tw
7	2025/10/14	Review Week (no class)	--		
8	2025/10/21	Midterm Exam (take-home exams, no in-class exam)	--		
9	2025/10/28 @B1 Auditorium	Post-Transcriptional Gene Control	Dr. Ho-Ming Chen	In-class exam on final exam date	homing@gate.sinica.edu.tw
10	2025/11/4	Biomembrane Structure and Transport	Dr. Ho-Ming Chen		
11	2025/11/11	Signal Transduction	Dr. Ho-Ming Chen		
12	2025/11/18 Online Only	Cellular Energetics	Dr. Ueng-Cheng Yang	Take-home exam with a specified deadline: ▶ 2025/12/2	uyang@nycu.edu.tw
13	2025/11/25 Online Only	The Eukaryotic Cell Cycle	Dr. Su-Chiung Fang	In-class exam on final exam date	scfang@gate.sinica.edu.tw
14	2025/12/2	Cancer	Dr. Liang-Chuan Lai	Take-home exam with a specified deadline: ▶ 2025/12/16	llai@ntu.edu.tw
15	2025/12/9	Review Week (no class)	--		
16	2025/12/16	Final Exam	--		

TIGP Bioinformatics Program
Biological Computing (C1)
Fall 2025 Syllabus

Latest syllabus: https://idv.sinica.edu.tw/tigpbio/

Place: Room 308, Institute of Statistical Science, Academia Sinica

Time: Friday 14:00-17:00

Chair: Dr. Huai-Kuang Tsai (hktsai@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: Hsin-Ying Chang **Email:** hyhazelchang@gmail.com
Office hours: Wednesday 13:00-15:00
Office location: Room R220, Institute of Plant and Microbial Biology, Academia Sinica
*You can also approach online via the link below:
https://join.slack.com/t/2025fallc1ta/shared_invite/zt-3bixawluo-8UI9EKo4Qu4OZ_H_ROaavQ

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 https://forms.gle/oK7vJzzrx9EvybbT9
(2) TIGP-BP Course Registration Consent Form
https://idv.sinica.edu.tw/tigpbio/index/TIGP%20Bioinformatics_Class%20Registration%20Consent%20Form.docx

※ 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:	Email
1	2025/9/5	Analysis of Algorithms	Dr. Jia-Ming Chang	Take-home exam with a specified deadline: ▶ 2025/10/28	chang.jiaming@gmail.com
2	2025/9/12	Recurrence	Dr. Jia-Ming Chang		
3	2025/9/19	Introduction to Data Structure (I)	Dr. Yu-Jung Chang	In-class exam on midterm exam date	abner.yjchang@gmail.com
4	2025/9/26	Class rescheduled to 9/30.	--	--	--
5	2025/9/30 (Tues) 14:00-17:00	Introduction to Data Structure (II)	Dr. Yu-Jung Chang	In-class exam on midterm exam date	abner.yjchang@gmail.com
5	2025/10/3 (No in-person class)	Algorithmic Techniques (Pre-recorded Video) Online Q&A Session on 10/9 17:00	Dr. Chen-Ching Lin	Take-home exam with a specified deadline ▶ 2025/10/17	chenching.lin@nycu.edu.tw
6	2025/10/8 (Wed) 14:00-17:00 (No in-person class)	Sequence alignment (Recorded Video) Online Q&A Session on 12/15 9:00	Dr. Emily Chia-Yu Su	Take-home exam with a specified deadline: ▶ 2025/12/19	emilysu@nycu.edu.tw
6	2025/10/10	Holiday—Double Tenth Day (no class)	--	--	--
7	2025/10/17	Review Week (no class)	--	--	--
8	2025/10/24	Midterm Exam rescheduled to 10/31. Make-up Day Off for Retrocession Day (no class)	--	--	--
9	2025/10/27 (Mon) 9:00-12:00 Online Only	Introduction to Data Mining	Dr. Henry Horng-Shing Lu	Take-home exam with a specified deadline ▶ 2025/11/27	henryhslu@nycu.edu.tw
9	2025/10/31	Midterm Exam	--	--	--
10	2025/11/7 (No in-person class)	Databases: An Overview (Pre-recorded Video) Online Q&A Session on 11/18 14:00	Dr. Yufeng Jane Tseng	Take-home exam with a specified deadline: ▶ 2025/12/2	yjtseng@csie.ntu.edu.tw
11	2025/11/14 Online Only	Fundamentals of Molecular Evolution and Phylogenetic Tree Construction	Dr. Jinn-Jy Lin	Take-home exam with a specified deadline: ▶ 2025/12/17	jinnjy@gmail.com
12	2025/11/21	The Analysis of Next Generation Sequencing Data	Dr. Hsin-Nan Lin	In-class exam on final exam date	arith@gate.sinica.edu.tw
13	2025/11/28	Structural Bioinformatics	Dr. Chen-Hsin Yu	Take-home exam with a specified deadline: ▶ 2025/12/19	albertchyu@gate.sinica.edu.tw
14	2025/12/1 (Mon) 14:00-17:00	Computational Proteomics	Dr. Ching-Tai Chen	In-class exam on final exam date	ctchen@utaipei.edu.tw
14	2025/12/5	Class rescheduled to 12/1.	--	--	--
15	2025/12/12	Review Week (no class)	--	--	--
16	2025/12/19	Final Exam	--	--	--

TIGP Bioinformatics Program

Fundamental Statistical Methods in Bioinformatics (S1)

Fall 2025 Syllabus

Latest syllabus: https://idv.sinica.edu.tw/tigpbio/

Place: Room 308, Institute of Statistical Science, Academia Sinica

Time: Thursday 9:00-12:00

Chair: Dr. Shin-Sheng Yuan (syuan@stat.sinica.edu.tw; shinshengyuan@gmail.com)

Outline: This course covers the fundamentals of statistics and basic tools for bioinformatics analysis. In the first part students will learn basic statistical concepts and methods, including probability, random variables and distributions, parameter estimation, hypothesis testing, regression analysis, and categorical data analysis. In the second part several commonly used methods in bioinformatics will be introduced, including statistical meta analysis, survival analysis, clustering, classification, and nonparametric statistics.

Textbook: Fundamentals of Biostatistics (author: Bernard Rosner), Cengage Learning.

Reference book: Pattern Recognition (author: Richard O. Duda, Peter E. Hart, and David G. Stork), Wiley.

TA: Ru-Yin Jian **Email:** ruyin6161@gmail.com
Office hours: Tuesday 13:00–15:00
Office location (online): https://meet.google.com/ymn-ypyd-nfe

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

【For Non-BP student】

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(2) TIGP-BP Course Registration Consent Form
https://idv.sinica.edu.tw/tigpbio/index/TIGP%20Bioinformatics_Class%20Registration%20Consent%20Form.docx

※ 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	Sub-topics/Detail Descriptions	Lecturers	Evaluation Method	Email
1	2025/9/4	Descriptive Statistics, Genomic Data Analysis	(1)Introduction to statistics (2)Descriptive statistics (3)Fundamental of molecular biology (4)Genomic data analysis	Dr. Chen-Hsiang Yeang	Take-home exam with a specified deadline: ▶ 2025/10/23	chyeang@stat.sinica.edu.tw
2	2025/9/11	Probability	(1)Applications in statistical genetics (2)Combinatorial analysis (3)Axioms of probabilities (4)Conditional probability and independence (5)Random variable and distribution function	Dr. Hsin-Chou Yang	In-class exam on midterm exam date	hsinchou@stat.sinica.edu.tw
3	2025/9/18	Discrete Distributions and Contingency Tables	(1)An application in pharmacogenetic study (2)Discrete/continuous/mixed distributions (3)Joint/marginal/conditional distributions (4)Special discrete distributions (5)Introduction to contingency table	Dr. Hsin-Chou Yang		
4	2025/9/25	Continuous distributions and basic statistics	(1)Continuous random variable (2)Expectation (3)Basic statistics (4)Limit theorems (optional)	Dr. Hsin-Chou Yang		
5	2025/10/2	Parameter Estimation and Confidence Interval	(1)Unbiasedness (2)Point estimation (substitution principles, least square estimate, maximum likelihood estimate) (3)Interval estimation	Dr. Shin-Sheng Yuan	In-class exam on midterm exam date	syuan@stat.sinica.edu.tw
6	2025/10/9	Hypothesis Testing, P-value and False Discovery Rate	(1)Hypothesis testing (2)Applications in cancer researches (3)Type I & type II errors and p-value (4)One-sample and two-sample z-tests (5)One-sample, two-sample, and paired t-tests (6)Bonferroni adjustment, false discovery rate, and q value	Dr. Grace S. Shieh	In-class exam on midterm exam date	gshieh@stat.sinica.edu.tw
7	2025/10/16	Review Week (No class)	--	--	--	--
8	2025/10/23	Midterm Exam	--	--	--	--
9	2025/10/30	Regression Analysis	(1)Applications (2)Simple linear regression & inference (3)Diagnostic and remedial measures (4)Matrix approach to simple linear regression (5)Multiple linear regression (6)Building the regression model	Dr. Grace S. Shieh	In-class exam on final exam date	gshieh@stat.sinica.edu.tw
10	2025/11/6	Class rescheduled to 11/25.	--	--	--	--
11	2025/11/13	Logistic Regression and Statistical Meta Analysis	(1)Logistic regression (2)Meta analysis (effect size, precision, study weights, summary effect, heterogeneity, fixed-effect model, random-effect model, software)	Dr. Shin-Sheng Yuan	Take-home exam with a specified deadline: ▶ 2025/11/28	syuan@stat.sinica.edu.tw
12	2025/11/20	Clustering	(1)Clustering by geometry (K-means, EM algorithm, hierarchical clustering, self- organizing map, principal component analysis, independent component analysis) (2)Clustering on graphs (Basic concepts, max flow – min cut, normal cuts, spectral clustering, and community detection) (3)Advanced topics (Chinese restaurant process and affinity propagation)	Dr. Chen-Hsiang Yeang	In-class exam on final exam date	chyeang@stat.sinica.edu.tw

13	2025/11/25 (Tues) 14:00-17:00	Survival Data Analysis	(1) Mantel-Haenszel test (2) Survival and hazard functions (3) Kaplan Meier estimate (4) Log-rank test (5) Proportional-hazards model (6) Lung cancer study	Dr. Hsuan-Yu Chen	Take-home exam with a specified deadline: ▶ 2025/12/18	hychen@stat.sinica.edu.tw
13	2025/11/27	Nonparametric Statistics (I)	(1) Bootstrap (2) One-sample sign test (3) One-sample Wilcoxon signed-rank test (4) Wilcoxon rank-sum test (Mann-Whitney U test) (5) Sign test for paired data (6) Wilcoxon signed-rank test for paired data	Dr. Wei-chung Liu	Take-home exam with a specified deadline: ▶ 2025/12/10	wliu1975@stat.sinica.edu.tw
14	2025/12/4	Nonparametric Statistics (II)	(1) Kruskal-Wallis test (2) Randomization/permutation test for two-way ANOVA (3) The product-moment correlation coefficient (4) Spearman rank correlation (5) Kendall's coefficient of rank correlation	Dr. Wei-chung Liu	Take-home exam with a specified deadline: ▶ 2025/12/18	
15	2025/12/11	Review Week (No class)	--	--	--	--
16	2025/12/18	Final Exam	--	--	--	--

TIGP Bioinformatics Program
Programming (Python) (P1)
Fall 2025 Syllabus

Latest syllabus: https://idv.sinica.edu.tw/tigpbio/

Place: Room 308, Institute of Statistical Science, Academia Sinica
Time: Friday 10:00-12:00
Chair: Dr. John Wang (johnwang@gate.sinica.edu.tw)
Outline: This course introduces basic aspects of programming language and its application in bioinformatics. First, fundamental programming techniques in Python are introduced. After that, this course focuses on the practical implementation of programs to analyze various biological data. The use of existing available resources from the Internet is also incorporated. Finally, the students implement bioinformatics projects (i.e., motif finding, pattern matching, sequence alignment, biomedical database analysis, etc.)
Textbook:
Python for Biologists: A complete programming course for beginners (Martin Jones)
Advanced Python for Biologists (Martin Jones)
(Reference) Python for Everybody - Exploring Data In Python 3 (Charles Russell Severance)
TA: Cai-Sian Liao **Email:** enelya2323@gmail.com
Office hours: Friday 12:00-14:00
Office location: Room 308, Institute of Statistical Science, Academia Sinica
Grades: Midterm exam 25%. Final exam 30%. Homework 35%. Class performance 10%.

【For Non-BP student】

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(1) Basic Enrollment Information form https://forms.gle/oK7vJzzrx9Evyb619
(2) TIGP-BP Course Registration Consent Form
https://idv.sinica.edu.tw/tigpbio/index/TIGP%20Bioinformatics_Class%20Registration%20Consent%20Form.docx
※ 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 (Midterm/Final Exams)	Homework	Email
1	2025/9/5	Introduction to Python	Dr. John Wang	No exam. Points merged with Week 6.	Honor Code Form: Due by 2025/9/12 (no score)	johnwang@gate.sinica.edu.tw
2	2025/9/12	Basic Elements of Python	Dr. Ching-Fen Chang	Take-home exam with a specified deadline: ▶2025/9/24	--	janechang.stev@gmail.com
3	2025/9/19	Basic statements I: branching programs and inputs	Dr. Ching-Fen Chang	Take-home exam with a specified deadline: ▶2025/10/8	--	
4	2025/9/26	Basic statements II: iterative programs	Dr. Jen-Hung Wang	Take-home exam with a specified deadline: ▶2025/11/7	Due by 2025/10/9	a04928@tmu.edu.tw
5	2025/10/3	Functions: scope rules and passing arguments	Dr. Jen-Hung Wang		Due by 2025/10/17	
6	2025/10/8 (Wed) 10:00-12:00	Modules, Files, and Exception Handling	Dr. Te-Chuan Chiu	Take-home exam with a specified deadline ▶2025/10/22	--	theochiu@cs.nthu.edu.tw
6	2025/10/10	Holiday—Double Tenth Day (no class)	--	--		--
7	2025/10/17	Review Week (no class)	--	--		--
8	2025/10/24	Midterm Exam rescheduled to 10/27. Make-up Day Off for Retrocession Day (no class)	--	--		--
9	2025/10/27 (Mon) 14:00-16:00	Midterm Exam (take-home exams, no in-class exam)				
9	2025/10/31	Regular expressions	Dr. Ting-Wei Lin	Take-home exam with a specified deadline: ▶2025/11/28	--	kevin99703012@gmail.com
10	2025/11/7	Object-oriented programming: classes	Dr. Ting-Wei Lin	Take-home exam with a specified deadline: ▶2025/11/28	Due by 2025/11/28	
11	2025/11/14	Introduction to Biopython	Dr. Ching-Fen Chang	Take-home exam with a specified deadline: ▶2025/12/7	--	janechang.stev@gmail.com
12	2025/11/21	Data analysis toolbox: NumPy, Pandas, Matplotlib	Dr. Ryandhimas Edo Zezario	Take-home exam with a specified deadline: ▶2025/12/12	Due by 2025/12/5	ryandhimas@citi.sinica.edu.tw
13	2025/11/28	Machine learning I: scikit-learn	Dr. Ryandhimas Edo Zezario	Take-home exam with a specified deadline: ▶2025/12/17	--	
14	2025/12/5	Machine learning II: scikit-learn & PyTorch	Dr. Ryandhimas Edo Zezario	Take-home exam with a specified deadline: ▶2025/12/20	Due by 2025/12/17	
15	2025/12/12	Review Week (no class)	--	--		--
16	2025/12/19	Final Exam (take-home exams, no in-class exam)	--	--		--

TIGP Bioinformatics Program
Seminar
Fall 2025 Syllabus

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

Seminar Announcement: https://www.stat.sinica.edu.tw/cht/index.php?
Place: Room 308, Institute of Statistical Science, Academia Sinica.
Time: Thursday 14:00-15:20
Chair: Academia Sinica: Dr. Chung-Yen Lin (Informatics), Dr. Chien-Ling Lin (Biology), Dr. Wei-chung Liu (Statistics)
Remarks:
1. Attend 2 non-BP Seminars (on or off campus) conducted in English within the current semester.
*The deadline for the report is **December 25th, 2025**.
2. Write 2 seminar reports (1-page A4, 12pt font, single-spaced). Template: https://idv.sinica.edu.tw/tigpbio/resources/Seminar_Student%20Report.pdf
3. Send the reports to your advisor/lab professor for grading and signature.
4. Submit the graded and signed reports (PDF file) to the BP office before December 25th.

Grades: Attendance 100% (2 non-BP seminar reports included)

Week	Date	Topics/Brief Description	Speaker's Affiliation	Speaker	Abstract	Student Host
1	2025/9/4	Unlocking the Mystery of Mysteries: Avian Speciation through the Lens of Genomics	Department of Life Science, National Taiwan Normal University	Prof. Shou-Hsien Li	🔗	Apriandy Angdresey
2	2025/9/11	From microalgae to giant viruses: genomics and biology of key players in carbon cycling	Institute of Plant and Microbial Biology, Academia Sinica	Dr. Chuan Ku	🔗	Kiran Kumar Eripogu & Hsin-Ying Chang (1)
3	2025/9/18	DualLoc: Advancing Multi-Compartment Protein Localization with Dual PLMs	Department of Computer Science and Engineering, National Taiwan Ocean University	Prof. Kuan Y. Chang	🔗	Ching-Ya Lin (1)
4	2025/9/25	Turning Genetic Discoveries into Real-World Clinical Impact	Graduate Institute of Biomedical Informatics, Taipei Medical University	Prof. Yu-Hsuan Joni Shao	🔗	Cai-Sian Liao

5	2025/10/2	Advancing Clinical Decision Support through Explainable AI and Machine Learning	Institute of Biomedical informatics, National Yang Ming Chiao Tung University	Prof. Emily Chia-Yu Su	🔗	Thi Huong Giang Pham
6	2025/10/9	Contingency and Directionality in Evolution	Biodiversity Research Center, Academia Sinica	Dr. Sheng-Feng Shen	🔗	Ru-Yin Jian (1)
7	2025/10/16	Review Week (no class)	--	--	--	--
8	2025/10/23	Midterm Exam Week (no class)	--	--	--	--
9	2025/10/30	Statistical applications for human genetic data: from GWAS to integrative analysis	Department of Statistics, National Taipei University	Prof. Shih-Kai Chu	🔗	Daniel Nelson
10	2025/11/6	Bioinformatics for Glycan Synthesis, Vaccine Design, and Intelligent Drug Discovery	The Master Program of AI Application in Health Industry, Kaohsiung Medical University	Prof. Cheng-Wei Cheng	🔗	Ching-Ya Lin (2)
11	2025/11/13	Codon Bias–Mediated Gene Regulation in animals: Temporal, Spatial, and Interventional Perspectives	Department of Biochemistry and Molecular Biology, National Cheng Kung University	Prof. Chien-Hung Yu	🔗	Saptashwa Datta
12	2025/11/20 Canceled	Leveraging Taiwan Biobank WGS Data to Improve Precision Diagnosis and Population Health in Taiwan	Graduate Institute of Medical Genomics and Proteomics, National Taiwan University	Prof. Jacob Shujui Hsu	🔗	Ya-Chu Hsu
13	2025/11/27	Capturing the Stars: Pharmacogenomics and Immunogenomics as My Targets	Graduate Institute of Medical Genomics and Proteomics, National Taiwan University	Prof. Pei-Lung Chen	🔗	Ru-Yin Jian (2)
14	2025/12/4 Online Only Canceled	AI in drug discovery and development	Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University	Prof. Yufeng Jane Tseng	🔗	Hsin-Ying Chang (2)
15	2025/12/11	Review Week (no class)	--	--	--	--
16	2025/12/18	Final Exam Week (no class)	--	--	--	--

TIGP Bioinformatics Program
Student Presentation
Fall 2025 Syllabus & Guidelines

Latest syllabus: https://idv.sinica.edu.tw/tigpbio/

Place: Online (Google Meet): https://meet.google.com/tdr-jtku-fkn

Time: Thursday, 15:30-17:00

Chair: Dr. Hsuan-Cheng Huang (hsuancheng@nycu.edu.tw)

*Effective from the 2014 Fall semester, all TIGP-BP students are required to present once a semester in student presentation.

*First Year Students: the paper should be assigned by your lab professor.

*The following schedule is confirmed and will not be changed. Please contact Dr. Hsuan-Cheng Huang if you do have difficulty with the assigned date.

*The presenter shall introduce the host and attended professors at the beginning of each seminar.

Week	Date	Topic	Student	Instructor *BP student's presentation should be evaluated by their respective thesis advisor or lab advisor.
1	2025/9/4	SHARK enables sensitive detection of evolutionary homologs and functional analogs in unalignable and disordered sequences	Hsin-Ying Chang (BP)	Dr. Chuan Ku
2	2025/9/11	Unsupervised clustering identified clinically relevant metabolic syndrome endotypes in UK and Taiwan Biobanks	Ru-Yin Jian (BP)	Dr. Huai-Kuang Tsai
3	2025/9/18	A pathology foundation model for cancer diagnosis and prognosis prediction	Hsu-Ching Huang (NYCU)	Dr. Hsuan-Cheng Huang
4	2025/9/25	A Foundation Model for Generalizable Disease Detection from Retinal Images.	Apriandy Angdresey (BP)	Dr. Hsin-Chou Yang
5	2025/10/2	The landscape of tolerated genetic variation in humans and primates	Hsuan-Ya Chiu (NYCU)	Dr. Hsuan-Cheng Huang
6	2025/10/9	No class	--	--

7	2025/10/16	Review Week (no class)	--	
8	2025/10/23	Midterm Exam Week (no class)	--	
9	2025/10/30	CelloType: a unified model for segmentation and classification of tissue images	Ching-Ya Lin (BP)	Dr. Huai-Kuang Tsai
10	2025/11/6	No class	--	--
11	2025/11/13	Dissecting cell identity via network inference and in silico gene perturbation	Daniel Nelson (BP)	Dr. Sheng-Hong Chen
12	2025/11/20	Sequence modeling and design from molecular to genome scale with Evo	Ya-Chu Hsu (BP)	Dr. Hsiao-Chun Huang
13	2025/11/27	Reengineering of a flavin-binding fluorescent protein using ProteinMPNN	Saptashwa Datta (BP)	Dr. Lee-Wei Yang
14	2025/12/4	A visual-language foundation model for computational pathology	Thi Huong Giang Pham (BP)	Dr. Chun-Ying Wu
15	2025/12/11	Review Week (no class)	--	
16	2025/12/18	Final Exam Week (no class)	--	

< Seminar presentation guidelines on the following pages >

Seminar presentation guidelines for Ph.D. program students:

2025-07-10

This research seminar course is intended to provide students planning a research career in Bioinformatics with the opportunity to develop the skill of critically reading and evaluating research papers. The course consists of a weekly timetabled session in which students will read, present and discuss research papers published on high impact journals. A fixed threshold of impact factors is not imposed. Use your common sense instead.

Guidelines:

1. **Research article**: Each week, students will choose RESEARCH papers to be presented.
    a. For NYCU students not in the TIGP-Bio program, the paper (+ supplements) pdf file should be emailed to (1) hsuancheng@nycu.edu.tw (Dr. Hsuan-Cheng Huang), (2) tigpbio@gate.sinica.edu.tw (TIGP-Bioinformatics Program office), (3) all students in student presentation class, and also (4) other participating professors at least one week before your in-class seminar presentation takes place. Any delay will result in 10 points deducted from your final grade. Please also send the slides to everyone 2 days before the report. Because some modifications may be made right before the report, it is okay if the slides are not the final version.
    b. For TIGP-Bio students, the paper (+ supplements) pdf file should be emailed to (1) your thesis advisor/lab advisor, (2) tigpbio@gate.sinica.edu.tw (TIGP-Bioinformatics Program office), (3) all students in student presentation class, and also (4) other participating professors at least one week before your in-class seminar presentation takes place. Any delay will result in 10 points deducted from your final grade. Please also send the slides to everyone 2 days before the report. Because some modifications may be made right before the report, it is okay if the slides are not the final version.

1. **Article selection:** You are required to select a recent RESEARCH article that was published after September 2020. (Review articles are NOT acceptable.)

2. **Presentations**: Everyone in the class will present one paper. You should plan to talk for around 40 minutes. Starting from this you should initiate a discussion of the paper (so it is a good idea to conclude your slide presentation with a selection of points to consider and discuss). We should plan to have time for a lively discussion of each paper; your job in giving a presentation is to initiate this discussion. Make sure to
    a. Draw **valid** conclusions from results of your presented paper.
    b. Summarize evidence for each conclusion. (How does the paper support its conclusions?)
    c. Compare the results with other similar experiments published previously, if appropriate.

- Please refrain from presenting an article written by your supervisor or your friends/classmates. You need to increase the exposure to the breadth and depth of bioinformatics research.
- Students are encouraged to prepare a few questions for group discussion at the end of the presentation. Students are not expected to simply sit in the class.

- Please make a rehearsed presentation if you don't know how long your presentation is going to last. An over-length presentation doesn't translate to a good one.

3. **Language of presentation**: You are required to present your research article in English.

Evaluation Criteria:

You will be evaluated by the following criteria:

1. Your attendance (10%).
2. Your seminar presentation (90%).

TIGP Bio Fall 2025 Syllabus

Lab Rotation

Dear First-Year Students:

1. Your lab advisor must be one of the BP core faculty.
2. Get in touch with your intended lab advisor and inform the BP office for the laboratory you are rotating by September 26th, 2025.
3. Submit the Lab Rotation Form with lab advisor's signatures and score to the BP office by December 25th, 2025.

Student (2025 enrolled)	Lab Advisor
Ching-Ya Lin 林靖雅	Dr. Huai-Kuang Tsai 蔡懷寬
Ya-Chu Hsu 許雅筑	Dr. Hsiao-Chun Huang 黃筱鈞
Thi Huong Giang Pham 范香江	Dr. Chun-Ying Wu 吳俊穎
Daniel Nelson 曾懌康	Dr. Sheng-Hong Chen 陳昇宏
Saptashwa Datta 薩普塔	Dr. Lee-Wei Yang 楊立威