

A summer short course:

Metabolic Biochemistry Made Easy

Description: A week-long intensive lecture course to cover basic subjects in metabolism, including biomolecules, enzymes, glycolysis, citric acid cycle, oxidative phosphorylation, pentose phosphate shunt, photosynthesis, lipid metabolism and amino acid metabolism. The course is most suitable for advanced undergraduate students and beginning graduate students who need to learn and/or refresh basic biochemistry in a natural and painless manner. The course will emphasize true understanding of basic metabolism, and keep sheer memorization to the minimum. It is expected that students will acquire and retain important knowledge about metabolic biochemistry. The lectures will be interactive and students will work on assigned problem sets and readings. Daily exams will be given to allow students to self-evaluate the learning process.

Recommended (not required) textbook: Tymoczko, Berg and Stryer, *Biochemistry, A Short Course, 3rd edition*

Other course materials: Outlines of daily lectures and PPT files will be made available to students.

Instructor:

Professor Tuan-hua David Ho <tho@gate.sinica.edu.tw>

Credit: 2 units

Schedule:

Monday to Friday:

9:30 to 12: Lectures; 12-1: Lunch break; 1-2:30: More lectures or problem set and reading period; 2:30-3:30 Daily exam; 3:30-4:30 Discussions and review

Saturday:

9-12: Final exam

Subjects to be covered:

Mon: Molecular interactions, Biomolecules (carbohydrates, lipids and proteins), Special lecture on biochem techniques

Tue: Enzymes, Glycolysis, Fermentation, Gluconeogenesis, Special lecture on biochem signaling process

Wed: Citric acid cycle, Oxidative phosphorylation

Thu: Pentose phosphate pathway, Photosynthesis

Fri: Fatty acid metabolism, Amino acid metabolism

MBAS 2023 Summer Course
Metabolic Biochemistry Made Easy (代謝生物化學概論)

Course Coordinator & instructor	Dr. Tuan-Hua David Ho 賀端華 (Distinguished Visiting Chair Professor, Institute of Plant and Microbial Biology, Academia Sinica)
Classroom	A236, 2F, Agricultural Technology Building, Academia Sinica 中央研究院農科大樓 2 樓 A236 教室
Dates & Time	7/10-7/15, 2023 7/10-7/14 (Monday to Friday): 9:30am-12pm: Lectures; 1pm-3pm: More lectures or problem set, reading period, Q&A; 3pm-4pm: Daily exam; 4pm-5pm: Discussions and review 7/15 (Saturday): 9am-12pm: Final exam
Credit	2 (elective)
Course objectives To provide an interacting environment for students to learn or regain the basic knowledge of metabolic biochemistry in the context of cells, which is fundamentally important for life science students in general.	
Course description A week-long intensive lecture course to cover basic subjects in metabolism, including biomolecules, enzymes, glycolysis, citric acid cycle, oxidative phosphorylation, pentose phosphate shunt, photosynthesis, lipid metabolism, amino acid metabolism and secondary metabolism. The course is most suitable for beginning graduate students who need to learn and/or refresh basic biochemistry <u>in an intuitive and interactive manner</u> . The course will emphasize true understanding of basic metabolism, and keep sheer memorization to the minimum. It is expected that students will acquire and <u>retain</u> important knowledge about metabolic biochemistry that would benefit their future research career. The lectures will be interactive and students will work on assigned problem sets and reading assignments each day. Daily problem-solving exams will be given to allow students to self-evaluate the learning process.	
Course evaluations Attendance (10%), Q & A (20%), Daily exams (40%), and Final written exam (30%)	
Textbook Tymoczko, Berg and Stryer, <i>Biochemistry, A Short Course 2nd or 3rd edition</i>	
Syllabus	
Date & Time	Topic
7/10 (Mon.)	Molecular interactions, Biomolecules (carbohydrates, lipids, proteins and nucleic acids)
7/11 (Tue.)	Enzymes, Glycolysis, Fermentation, Gluconeogenesis
7/12 (Wed.)	Citric acid cycle, Oxidative phosphorylation
7/13 (Thu.)	Pentose phosphate pathway, Photosynthesis
7/14 (Fri.)	Overview of fatty acid metabolism, amino acid metabolism and secondary metabolism
7/15 (Sat.)	Final exam