Schedule Intro Struct Biol – Semester A 5783, 2024-25

Time:
Sunday 12-14 and Wednesday 10-12, hall 06, UK Building
Grade: The course is 4 credit hours (3 lecture + 1 exercise). The date of the final exam we set as based on the students. The exam is take-home. Generally, we give the students about 10 days to do it. In the past 3 years, the students have opted for a submission date very close to the beginning of Semester B. The final grade for the course is comprised of 60% based on the exam and 40% based on problem sets, which are graded by the TA. There are 4 problem sets; submission dates are highlighted in red in the schedule below.

	Date	Lecturer	Topic	Supplemental reading material
Week 1	Lesson 1 (Nov. 3)	Nir	Introduction (1): protein roles, physico-chemical principles	Kessel & Ben-Tal, Ch.1
		Nir	Protein Structure (1): introduction, primary structure	Kessel & Ben-Tal, Ch.2 (2.1-2.2) or Branden and Tooze Ch.1-5
	Lesson 2 (Nov. 6)	Nir	Protein Structure (2): primary structure	Kessel & Ben-Tal, Ch.2 (2.2)
		Nir	Protein Structure (3): secondary structure	Kessel & Ben-Tal, Ch.2 (2.3)
Week 2	Lesson 3 (Nov. 10)	Nir	Protein Structure (4): tertiary structure	Kessel & Ben-Tal, Ch.2 (2.4)
		Gabi	Models, visualization and biological databases	
	Lesson 4 (Nov. 13)	Nir	Protein Structure (5): quaternary structure, PTM	Kessel & Ben-Tal, Ch.2 (2.5-2.6); Branden and Tooze Ch.14
		Nir	Protein Structure (6): fibrous proteins	Kessel & Ben-Tal, Ch.6 (6.2)
Week 3	Lesson 5 (Nov. 17)	Nir	Computational structure prediction methods	Kessel & Ben-Tal, Ch.3 (3.1-3.3); Branden & Tooze Ch.18
	Lesson 6 (Nov. 20)	Gabi	Homology modeling and AI-based structure prediction	
		Gabi	Experimental methods overview	Kessel & Ben-Tal, Ch.3 (3.4-3.5) ; Branden and Tooze Ch.17
Week 4 Homework 1	Lesson 7 (Nov. 24)	Gabi	X-ray crystallography and Cryo-EM	
	Lesson 8 (Nov. 27)	Gabi	Light reactions and fluorescence spectroscopy	
		Nir	Energetics and stability	Kessel & Ben-Tal, Ch.4

Week 5	Lesson 9 (Dec. 1)	Nir	Dynamics	Kessel & Ben-Tal, Ch.5 (5.3.1-2)
	Lesson 10 (Dec. 4)	Nir	Dynamics	
		Nir	Unstructured proteins	Kessel & Ben-Tal, Ch.6
Week 6	Lesson 11 (Dec. 8)	Nir	Protein-Ligand Interactions (1): models and energetics Protein-Ligand Interactions	
		Nir	(2): AChE inhibitors, drug design	
	Lesson 12 (Dec. 11)	Nir	Protein-Ligand Interactions	Kessel & Ben-Tal, Ch.8 (8.4; 8.6)
		Nir	Protein archeology	
Week 7 Homework 2	Lesson 13 (Dec. 15)	Nir	Membrane Proteins (1): introduction, primary, secondary & tertiary structure	Kessel & Ben-Tal, Ch.7; Branden and Tooze Ch.12
		Nir	Membrane Proteins (2): peripheral proteins, membrane-protein interactions	
	Lesson 14 (Dec. 18)	Nir	Membrane proteins: CPA transporters	
Week 8	Lesson 15 (Dec. 22)	Gabi	RTK dimerization and phosphorylation, molecular dynamics simulations	
	Lesson 16 (Dec. 25)	Nir	GPCRs	
Week 9	Hanuka vacation			
	Lesson 17 (Jan. 1)	Gabi	Symmetry, pores and channels	
Week 10	Lesson 18 (Jan. 5)	Nir	Channels	Kessel & Ben-Tal, Ch.8 (8.1-8.4); Branden and Tooze Ch.15

	Lesson 19 (Jan. 8)	Nir	Channels	
Week 11 Homework 3	Lesson 20 (Jan. 12)	Gabi	Nucleotides and nucleic acids	Brandon & Tooze Ch.7
	Lesson 21 (Jan. 15)	Gabi	DNA structure	
Week 12	Lesson 22 (Jan. 19)	Gabi	RNA structure	
	Lesson 23 (Jan. 22)	Gabi	Protein/ Nucleic Acid Recognition	Brandon & Tooze Ch.8 – 9
Week 13	Lesson 24 (Jan. 26)	Gabi	Protein/ Nucleic Acid Recognition	
	Lesson 25 (Jan. 29)	Gabi	Protein/ Nucleic Acid Recognition	
Week 14 Homework 4	Lesson 26 (Feb. 2)	Gabi	Integrative structural biology	