Schedule Intro Struct Biol – Semester A 5783, 2022-23

Lectures:
Sunday 12-13, hall 06, UK Building
Wednesday 10-12, hall 06, UK Building
Tutorial:
Sunday 13-14, room 06, UK Building (PC room, Sherman lobby in the first weeks)
Teaching Assistant: Gabriel Axel
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 2 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 5 problem sets.

	Date	Lecturer	Topic	Supplemental reading material
Week 1	Lesson 1 (Oct. 23)	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 (Oct. 26)	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 (Oct. 30)	Nir	Protein Structure (4): tertiary structure	Kessel & Ben-Tal, Ch.2 (2.4)
		Nir	Protein Structure (5): quaternary structure, PTM,	Kessel & Ben-Tal, Ch.2 (2.5-2.6); Branden and Tooze Ch.14
	Lesson 4 (Nov. 2)	Nir	Protein Structure (6)	
		Nir	Fibrous proteins	Kessel & Ben-Tal, Ch.6 (6.2)
Week 3	Lesson 5 (Nov. 6)	Nir	Structure prediction methods	Kessel & Ben-Tal, Ch.3 (3.1-3.3); Branden & Tooze Ch.18
		Gabi	Molecular visualization tutorial I – Pymol	Kessel & Ben-Tal, Ch.2 (2.4)
	Lesson 6 (Nov. 9)	Joel	Experimental methods	Kessel & Ben-Tal, Ch.3 (3.4-3.5) ; Branden and Tooze Ch.17
		Joel	Experimental methods	

Week 4	Lesson 7 (Nov. 13)	Gabi	Molecular visualization tutorial II – Pymol	
		Joel	Experimental methods	
	Lesson 8 (Nov. 16)	Nir	Energetics and stability	Kessel & Ben-Tal, Ch.4
		Nir	Dynamics	Kessel & Ben-Tal, Ch.5 (5.3.1-2)
Week 5	Lesson 9 (Nov. 20)	Nir	Dynamics	
		Gabi	Experimental methods + Coot tutorial	
	Lesson 10 (Nov. 23)	Nir	Membrane Proteins (1): introduction, primary structure	Kessel & Ben-Tal, Ch.7 (7.1-7.3.2); Branden and Tooze Ch.12
		Nir	Membrane Proteins (2): secondary & tertiary structure	Kessel & Ben-Tal, Ch.7 (7.3.2-7.3.3)
Week 6	Lesson 11 (Nov. 27)	Nir	Membrane Proteins (3): peripheral proteins, membrane-protein interactions	Kessel & Ben-Tal, Ch.7 (7.33-7.4)
		Gabi	Protein energetics Symmetry	
	Lesson 12 (Nov. 30)	Nir	Membrane proteins: CPA transporters	
		Nir	GPCRs	
Week 7	Lesson 13 (Dec. 4)	Nir	GPCRs	
		Gabi	Working with sequences Homology modeling	
	Lesson 14 (Dec. 7)	Joel	Channels	
		Joel	Channels	

Week 8	Lesson 15 (Dec. 11)	Gabi	Water channels Structure of AQP1 The pathway through the channel Selectivity mechanisms Structure prediction in TM proteins	
		Joel	Channels	
	Lesson 16 (Dec. 14)	Joel	Channels	
		Joel	Channels	Kessel & Ben-Tal, Ch.8 (8.1-8.4); Branden and Tooze Ch.15
Week 9	Lesson 17 (Dec. 18)	Nir	Protein-Ligand Interactions (1): models and energetics Protein-Ligand Interactions	
		Nir	(2): AChE inhibitors, drug design	
	Lesson 18 (Dec. 21)	Nir	Protein-Ligand Interactions	Kessel & Ben-Tal, Ch.8 (8.4; 8.6)
		Nir	Protein archaeology	
Week 10	(Dec. 25)		Hanuka vacation	
	Lesson 19 (Dec. 28)	Joel	Nucleic Acids	Brandon & Tooze Ch.7
		Joel	Nucleic Acids	
Week 11	Lesson 20 (Jan. 1)	Gabi	Surface area and superposition	
		Gabi	RTKs and the ErbB family Ligand-induced dimerization of EGFR and ErbB2 + Chimera tutorial	
	Lesson 21 (Jan. 4)	Joel	Nucleic Acids	
		Joel	Nucleic Acids	

Week 12	Lesson 22 (Jan. 8)	Joel	Nucleic Acids	
		Gabi	Fiber diffraction	
	Lesson 23 (Jan. 11)	Joel	Nucleic Acids	Brandon & Tooze Ch.8 - 9
		Joel	Protein/ Nucleic Acid Recognition	
Week 13	Lesson 24 (Jan. 15)	Joel	Protein/ Nucleic Acid Recognition	
		Joel	Protein/ Nucleic Acid Recognition	
	Lesson 25 (Jan. 18)	Joel	Protein/ Nucleic Acid Recognition	
		Joel	Protein/ Nucleic Acid Recognition	
Week 14	Lesson 26 (Jan. 22)	Gabi	DNA binding Proteins + limited diffusion	
		Joel	Protein/ Nucleic Acid Recognition	