L#	Date	Time	Lecturer	Topic	Chapter reading
1	7.10.	14:00 - 16:30	Pavel Plevka	Development of X-ray crystallography, crystallization of macromolecules, phase diagram, Crystal symmetry, symmetry operators, point groups, space groups.	Drenth: 1, 2, 3
2	14.10.	14:00 - 16:30	Pavel Plevka	Diffraction of light by electrons, atoms, unit cell, crystal. Bragg's law. Diffraction images and indexing.	Drenth: 4
3	21.10.	14:00 - 16:30	Pavel Plevka	Fourier transform, structure factor, intensity of diffraction spots.	Drenth: 4, 5
4	28.10.	14:00 - 16:30	Pavel Plevka	Solutions to phase problem in X-ray crystallography. Isomorphous replacement, SAD, MAD, Molecular replacement. Rotation and translation function. Model building and refinement.	Drenth: 7, 10
5	4.11.	14:00 - 16:30	Tibor Füzik	Electron microscope. Interaction of electrons with matter, electron imaging. Amplitude and phase contrast. Contrast transfer function.	Frank: 1, 2
6	11.11.	14:00 - 16:30	Tibor Füzik	Fourier transform and its properties, convolution, point spread function.	Frank: 2
7	18.11.	14:00 - 16:30	Jiří Nováček	Analysis of electron micrographs. 2D classification. Principal component analysis.	Frank: 3, 4
8	25.11.	14:00 - 16:30	Jiří Nováček	Three dimensional reconstruction - single particle reconstruction and tomogram calculation. 3D classification.	Frank: 5
9	2.12.	14:00 - 16:30	Jiří Nováček	Improving cryo-EM reconstruction, particle polishing, Ewalds, sphere correction, per particle CTF, … Model building and refinement. Detection of errors, validation and detection of mistakes.	Frank: 6
10	TBD	TBD	Holger Stark	State-of-the-art cryo-EM of macromolecular complexes.	
11	TBD	TBD	Holger Stark	State-of-the-art cryo-EM of macromolecular complexes.	