

These lecture notes are intended to support the compulsory course *Classical and quantum statistical physics of molecular systems* taught in the MSc. degree plan *Biophysics and Chemical Physics* at the Faculty of Mathematics and Physics, Charles University, Prague.

The text is structured into three parts. We begin by revisiting the substance of equilibrium statistics in a fully quantum formalism of the density matrix. The central part of the course is focused on the evolution of the density matrix and builds a unified description of the relaxation of molecular spins, vibrations and electronic states. And the course is concluded by outlining how this toolkit allows for the conceptualization of optical probes of molecular dynamics.

Readers are expected to have a knowledge of quantum theory and classical statistical physics at the level of introductory university courses, as well as a skill in routine mathematical calculus. Chapters marked by asteriks * cover some relevant and interesting but more technically demanding topics and are therefore optional for students.

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