

# Jozef Adam Liwo

## Statement of Teaching Philosophy

I have an over 25-year history of teaching various courses (beginning with general chemistry lab classes) at the Faculty of Chemistry, University of Gdańsk. The primary course that I am teaching and directing now is Theoretical Chemistry (a M.Sc. course which includes principles of molecular modeling and application of statistical mechanics in chemistry). I am also teaching a number of optional courses related to molecular simulations, protein structure, computer programming, and numerical methods in chemistry to undergraduate and graduate students. All the courses that I am teaching now are directly related to my research and I designed all of them from the scratch. The full list of courses that I am teaching or taught in the past is included in my CV.

I am conducting lectures and part of recitation and lab classes. My goal is not merely to convey knowledge to the students and give them ready-to-use recipes to solve simple problems but to make the **understand** the matter and apply the knowledge they acquired to solve problems more complex than, e.g., the computation of a vibrational frequency of a diatomic molecule given the masses of the atoms and the force constant. During the recitation classes and interim tests I challenge the students constantly by changing the formulation of problems and input data to prevent them from developing a fixed scheme (e.g., that simple problems pertaining to the Boltzmann law are always about computing the change of the density of air with altitude provided that the temperature is constant).

I never require the students to learn formulas or theorems by heart. During the tests and exams a summary of necessary formulas is attached to every problem set. In my opinion such an attitude of mine teaches them to look into sources for the information required to solve a problem. For the same reason, I do not stick to one textbook when preparing my classes. At the beginning of a course, I give the students a list of recommended textbooks and web pages; I also publish the course material on [my web page](#). In my courses I stress the balance between theory and practical aspects of a subject. I pay much attention to convince the students that theoretical chemistry, though based on equations and numbers rather than on test-tubes and reagents, enables us to understand what is actually happening in a test-tube and that their effort invested in learning that subject will pay off even if they will not become theoretical chemists.

I tune the method of teaching to the type of course and expected outcome. The purpose of my courses is to teach science and, therefore, I present the theory illustrated with selected examples during the lectures, while recitation and lab classes are devoted to solving concrete problems.

I encourage the students to ask questions during a lecture and to point to errors and lack of clarity in the slides or in what I am saying. I also tell them to be critical about the content of textbooks and point to errors therein. I am also available to the students in my office whenever they have course-related questions or problems.

I am open to implementing new teaching technologies. Together with Janusz Kowalik (Professor Emeritus of Washington University at Seattle and now a Visiting Professor and the Faculty of Mathematics, Physics, and Informatics, University of Gdańsk), owing to a "Technology for Teaching" grant from Hewlett-Packard which I was the PI of in years 2008-2009, we introduced the tablet-based classroom solution to at the Faculty of Mathematics, Physics, and Informatics with 21 networked tablets. During the class, the tablets are used as a means of two-way communication between the teacher and the students.