Teaching Portfolio

Ulla Gro Nielsen
Department of Physics, Chemistry and Pharmacy
Email: ugn@sdu.dk

Formal Educational Training

Education:

1998 – 2002 Ph.D. studies, Department of Chemistry, University of Aarhus.
1993 - 1998 M.Sc. studies in Chemistry and Physics, University of Aarhus, which includes the coursework required to teach physics and chemistry at a Danish High School (“Tofagskompetence i kemi og fysik”)

Post graduate pedagogical training and certification:

2015English, certified as level C2 oral (“Mastery”, highest grade)
2015Assessment methods (Seminar, SDU)
2015 Ph.D. advisor course
2010 Teaching Science (1 day course, SDU)
2007-2008Teacher Training Program for Assistant Lecturers “Adjunktpædagogikum”

Administrative tasks related to teaching

2008-Censor Chemistry at the Danish Universities (written exams in inorganic chemistry, environmental chemistry and analytical spectroscopy; oral exams in Environmental Chemistry). M.Sc. and B.Sc. thesis at Copenhagen and Aarhus Universities
2012–Chair 3 Ph.D. assessment committees, University of Southern Denmark
2016-4 Ph.D. assessment committees, University of Oslo, University of Oulu, Finland, Technical University of Denmark, Copenhagen University, Ecole Normale Superior Lyon, France
2018-Censorkorpset Chemical Engineering,

Experience with teaching, supervision and examination

2019KE542 (revised KE536) ca 1.25 of 10 ECTS
2017-KE535 Chemistry for biologists, B.Sc. course (ca 7 out of 10 ECTS, administrator)
2016-2018KE536 Chemistry – Introduction to research and application (ca 1.25 of 5 ECTS)
2016-KE836 Materials Characterization, M.Sc. course (2.5 of 5 ECTS)
2011-KE801 Inorganic Chemistry B, M.Sc. course (5 ECTS, administrator)
2009 -KE811 Advanced NMR Spectroscopy, M.Sc. & Ph.D. course (Ca. 1 ECTS of 5 ECTS)
2007-2012KE804 Molecular Spectroscopy, M.Sc. course (Ca 5 ECTS of 10 ECTS course)
2007-2014KE507 Environmental Chemistry, B.Sc. course (5 ECTS, administrator)
1998-2002Teaching assistant in Applied Spectroscopy (NMR, IR, MS and UV-VIS), Physical Chemistry, Chemistry for biology majors, University of Aarhus primarily B.Sc. level courses
1997Chemistry Course for high school students (4 week intensive course, University of Aarhus)

Methods, materials and tools

1.Lectures are aimed at introducing new topics and knowledge to the students, but involves a high degree of student activity either by short exercises or so-called work sheets aimed at refreshing previous topic or, more importantly, to use and further expand the newly introduced topics. Even in larger classes (40-50 students), I rarely lecture for 2 hrs straight and often combine lectures and tutorial session to improve students activity. I develop these work sheets often using illustrative examples from research or everyday life, the latter especially important at the undergraduate level. These serve to train some of the key aspects of the curriculum.

2.Tutorial Session, which generally have 20-30 students. This is where the students apply and improve their knowledge. This is probably the most efficient way to teach students. I favor a system, where the students work in smaller groups to solve problems at their pace. To differentiate, I will often prioritize the problems to ensure that the weaker students achieve a minimum goal while at the same time the best are challenged.

3.Laboratory is aimed to demonstrate important aspects of the curriculum and acquire practical skills in the laboratory. I have mainly taught an advanced inorganic chemistry class. The questions in the reports touch on core aspects and also require the students to search for information and not just find a statement in the textbook.

4.Course material. Generally, I develop problem and works sheets for my classes as well have laboratory problems. For examples, I have developed a series of materials chemistry laboratory exercises in inorganic chemistry and introduced several advanced characterization techniques. One of these has been published in Journal of Chemical Education.

5.Projects e.g., B.Sc. and M.Sc are adapted to the student, as elaborated above, as these all have different strengths and weaknesses.

6.Examinations courses are either assessed by oral or written exams, whereas reports, presentations and a combination of these have been used for individual projects from first year projects to Ph.D. exams.

7.Dissemination I have on several occasions given lectures to the public and also written a few “popular science articles (vide infra).

8.Teaching Assessment. I always assess each course informally, asking the students to list “The three best aspects” and “Three aspects that may be improved”, which are of course considered in the following year.

Publications related to teaching and dissemination

1.T.E. Warner, M.G. Klokker, and U.G. Nielsen, Synthesis and characterization of zeolite Na-Y and its conversion to the solid acid H-Y, Journal of Chemical Education, 94 (2017) 781-785. doi10.1021/acs.jchemed.6b00718. This was written based on a laboratory exercises in KE801. Assoc. Prof. Terence Warner developed the synthesis protocol and I designed the characterization methods to applied including NMR, PXRD and TGA.
2.Ny metode til måling af polyfosfat i spildevandsslam, K. Reitzel, P.H. Nielsen, L. Boisen Staal, M. Nierychlo, U.G. Nielsen og C.A. Jørgensen, Dansk Kemi, 6/7, 2016, 24-26.
3.Kemisk Sørestaurering, K. Reitzel, L. Dithmer, and U.G. Nielsen, Dansk Kemi 6/7, 2015 22-24 (Chemical Lake Restoration,
4.ReCoverP- genindvinding af fosfor fra spildevand, Dansk Kemi, K. Reitzel, P.H. Nielsen, M.L Christensen, H. Qu, R. Wimmer, M. Nierychlo, C. Jørgensen, and U.G. Nielsen, Dansk Kemi 6/7, 2015 24-27