

Innholdskrav	Utdypende opplysninger og kommentarer
Name	Interdisciplinary molecular sciences: From quantum mechanics to medicine
Course code	KJE-3001
Course type	Theoretical and practical subject. Mandatory course in the <i>Master in Molecular Sciences</i> program, and available as a singular or elective course independent of study program, also to exchange students and free-movers.
No of ECTS	20
Recommended previous knowledge	Admission to the course requires a Bachelor Degree in one of the natural sciences, including core chemistry courses, general physics, and calculus
Content	<p>The course aims to prepare students for advanced training and work in the interdisciplinary fields of modern molecular sciences, both within or outside of academia. The course will provide students with tools and techniques for acquiring, reviewing and presenting scientific data and introduce them to scientific standards and traditions for referencing and publishing. The knowledge acquired through the course will be demonstrated in a final project addressing a scientific observation, innovation or problem relevant for the society, either in general or specifically.</p> <p>The course will consist of three parts:</p> <ol style="list-style-type: none"> 1. Information resources and communication tools (4 ECTS) 2. Core technologies of molecular sciences (12 ECTS) 3. Interdisciplinary project work (4 ECTS) <p>1. Information resources and communication tools Via seminars and lectures, students will become familiar with scientific databases, authorship and publication ethics, presentation techniques, and concepts related to scientific publishing and result dissemination: <i>Tools:</i></p> <ul style="list-style-type: none"> • Referencing tools • Literature searches • Presentation tools <p><i>Techniques:</i></p> <ul style="list-style-type: none"> • Oral presentation techniques • Scientific reports and articles: types, structuring, referencing <p><i>Ethics and guidelines:</i></p> <ul style="list-style-type: none"> • Citation styles and standards in molecular sciences • Scientific publications: components, authorship, publication stages • Copyright and open access models <p>2. Core technologies of molecular sciences Four technology modules reflecting topics which are most relevant for future interdisciplinary work on applied projects are available to the students. A common textbook for the course, supplemented by additional materials where necessary, will describe interdisciplinary projects from different technological points of view. The core technology areas are:</p> <ol style="list-style-type: none"> 1. Chemical structure, bonding, and reactivity 2. Computational chemistry and molecular modelling 3. Macromolecular chemistry 4. Bioinformatics

	<p>Depending on the number of students on the course, the students' background and interests, the students must choose three of the modules, alternatively participate in at least 75% of the lectures.</p> <p>3. Interdisciplinary project work Each student will author a paper and present a lecture on a project assignment to demonstrate mastery of the course material. The assignment will be chosen from among the thematic areas of the Master program in Molecular Sciences (Chemistry of the Cell, Drug Discovery and Design, Scientific Computing in Chemistry and Biology, Functional Materials, Catalysis) and be based on current interdisciplinary topics of interest from across the areas of molecular sciences, and will be defined to involve collaboration with other students of the course. The paper and lecture will comprise the major part of the assessment of student performance.</p>
Learning outcome	<p>Knowledge: The student...</p> <ul style="list-style-type: none"> • will have in-depth knowledge of techniques used in oral and written scientific communication • will understand how to search scientific databases efficiently • will understand how to structure various types of scientific reports • will understand the legal framework of scientific publication <p>Skills: The student will be able to...</p> <ul style="list-style-type: none"> • conduct literature and data searches • write clear and concise professional scientific reports and oral presentations • make appropriate choices regarding publication styles and copyright conditions • explain a scientific observation, innovation or problem using an interdisciplinary approach, combining knowledge and methods from several sub-topics. <p>Competence: The student:</p> <ul style="list-style-type: none"> • can communicate scientific results both in writing and orally, with appropriate standards and structures • can evaluate and edit his/her and others scientific reports • is able to understand the relationship between knowledge and presenting knowledge • combine knowledge from several topics and obtained from different sources to put molecular sciences in a scientific and societal context.
Teaching	Lectures 80 hours + Project/assignment
Quality control	Student and teacher evaluation every second or third year
Exam qualification	Mandatory participation in learning activities
Exam and evaluation	Approved digital portfolio containing assignments and approved oral presentations. Passed/not passed.
Re-sit exam	No re-sit exam
Course material	Course material for the course will be made available and announced prior to course start.

Teaching language	The language of instruction is English and all of the syllabus material is in English. The reports will be written in English.
Other	