

Semester 5 Life Sciences

CU04990	<p>Infection & Immunity</p> <p>In this course you will study bacteria and viruses and the mechanisms by which they cause disease. In addition, you will get acquainted with the complex reaction of our immune system to invading microorganisms. Finally the basics of cell and tissue culture will be explained.</p>	<p>Number of Credits: 7,5</p>	<p>Language: English</p>
CU05004	<p>Molecular biology</p> <p>At the molecular level, all life forms are similar. The processes with which they acquire energy, spend energy, grow, replicate and adept all follow the same basic rules. Molecular Biology studies these rules, from metabolism of unicellular bacteria to cellular communication in mamals. In this course we will deal with the basic chemistry of life, the structure and function of proteins and how to study them, the energy metabolsim of sugars, fats and amino acids, and how all these factor are related to the life style and living environment of the organism. We will also investigate the relation between cell cycle control and cancer, which is the second major cause of death in the western world. In other words, we will study the stuff of life.</p>	<p>Number of Credits: 5,0</p>	<p>Language: English</p>
CU04991	<p>Genetic and genomic research</p> <p>With the completion of the Human Genome Project, in which the entire DNA sequence of a human was determined, has launched an era of scientific and technological development that is practically unparalleled in modern history. the speed and cost of genetic sequencing has literally plummeted. Sequencing of the first human genome took 10 years and cost nearly \$3,000,000,000.-, nowadays (only 10 years after its completion, it takes roughly a week with a cost of \$10,000.- nowadays. The knowledge we have gained on human genetic diversity enables us to determine not only gender, but also geographic origin, hair and eye color of an unidentified DNA sample (CSI). Screening unborn children for genetic diseases (e.g. Down syndrome) can now extract fetal DNA from the blood of the mother instead a sample of amniotic fluid, with all risks of inducing abortion. We can determine the risk someone has for developing certain forms of cancer by a genetic profile (e.g breast cancer). Besides human genetics, genomic screens are now common practice in breeding new variants of plants that are resistant for drought or pests, genetic engineering has produced cotton plants that produce their own insecticide, and instead of insulin extracted from the pancreas of pigs, genetic engineering of enables us to produce human insulin in bioreactors to treat diabetics. Genetics is everywhere in our society, and in this course we will study its principles, techniques, and application from basic single gene cloning to genome wide screening and whole genome sequencing.</p>	<p>Number of Credits: 5,0</p>	<p>Language: English</p>
CU13415	<p>Bioinformatics</p> <p>Data, data, everywhere there's data. Due to the enormous reduction in sequencing costs and the technical ease with which sequences can be determined, bio molecular research is literally being swamped by a deluge of data. Somehow, someone will need to make sense of it all, so enter the information technology. Besides storing and managing the data, an achievement in itself, sharing and comparing the sequences is also required to reveal the invisible patterns of similarities and differences, the biological consequences of sequence variants and the evolutionary reasons underlying the enormous sequence variation that binds and distinguishes all life forms. Although bioinformatics itself is a scientific discipline that combines mathematics, information sciences and biology, in this course we will focus on the practical side, asking the following questions: "What can I actually learn from this sequence?" and "How on earth should I begin?"</p>	<p>Number of Credits: 2,5</p>	<p>Language: English</p>
CU13416	<p>Biotechnology</p> <p>This course is the culmination of 5 semesters of various (molecular) biology courses. All subjects from the previous courses will be reinterpreted in the context of the diverse and multidisciplinary biotechnological workforce that the students will become part of. Biotechnology draws knowledge and expertise from many basic sciences and combines that knowledge in a wide array applications.</p>	<p>Number of ECTS: 2,5</p>	<p>Language: English</p>

Semester 5 Applied Chemistry			
CU04987	<p>Polymer chemistry</p> <p>This course gives an introduction on the chemical structure of the most common polymers, formation mechanisms and properties. Also the polymer processing is discussed like extrusion, (blow) moulding and spinning and the re-use of polymers.</p>	<p>Number of ECTS: 7,5</p>	<p>Language: English</p>
CU04986	<p>Advanced Chromatography</p> <p>After the separation technics course, in which you learnt the basic principles of separation techniques – fluid-fluid and solid-fluid extraction, gas chromatography and fluid chromatography – you will now focus your attention on sample pre-treatment and quantitative analysis. In the practicals you will test the theory of different injection techniques and derivatisation methods in gas chromatography.</p>	<p>Number of ECTS: 7,5</p>	<p>Language; English</p>
CU15623	<p>Advanced analysis</p> <p>High end techniques</p>	<p>Number of ECTS: 7,5</p>	<p>Language: English</p>

Semester 5 Courses for both Applied Chemistry & Life Sciences specializations			
CU04905	<p>Extended Statistics</p> <p>As a follow-up to basic statistics this course is about a next step to understanding and applying statistical techniques. We also make use of the statistical possibilities of the computer package Excel.</p>	<p>Number of ECTS: 2,5</p>	<p>Language: English</p>
CU03740	<p>Research Methods</p> <p>The course Research Methods is an orientation on methods of research in line with the research framework of the HZ. Both cognitive and practical exercises are subject of the course. Thus, research skills are widely discussed and make this course a good preparation and support of research projects, internships and graduation and provides opportunities to continue study of qualitative and / or quantitative research methods.</p>	<p>Number of ECTS: 2,5</p>	<p>Language; English</p>

CU04905	Titel: Extended Statistics 1				Aantal EC's: 2,5	Verplicht/ke			
Voorwaarden voor deelname: CU03739 Basic Statistics									
Bijzondere voorwaarde voor toekenning studiepunten (afvinktoets): geen									
Beknopte beschrijving van cursusinhoud: As a follow-up to basic statistics this course is about a next step to understanding and applying statistical possibilities of the computer package Excel.									
Toets nr	Vorm				Inhoud	Wegings factor	Bodem-cijfer	Planning toets in week	Inz
	M	S	A	Vorm					
1		X		Open vragen, Individuele toets in computerlokaal	We use Excel ipv SPSS: correlationcoëfficiënt r determinationcoëfficiënt r ² 1- factor ANOVA model the chikwadraattoets 2- factor ANOVA	100%	5.5	S1: week 4 S2: week 23	We We

CU03740	Titel: Research methods				Aantal EC's: 2.5	Verplicht/		
Voorwaarden voor deelname: geen								
Bijzondere voorwaarde voor toekenning studiepunten (afvinktoets): geen								
<p>Beknopte beschrijving van cursusinhoud: Research begins with the formulation of a problem statement, on the basis of this process this information orally and in writing. Starting point is the HZ-framework research and the related competence, share</p> <p>Competency: Research do is ask a question, think of a method to get an answer, data collection and analysis, a response to the activities and findings report to third parties.</p>								
Toets nr	Vorm				Inhoud (deeltaken)	Wegings factor	Bodem-cijfer	Planning toets in week
	M	S	A	Vorm				
1		X		Multiple choice Individual Knowledge	1.1, 1.2, 1.3, 2.1, 2.2 3.1, 3.2 4.1	50%	5.5	S1 Week 4 S2 week 23
2		X		Student file Individual Skills	1.1, 1.2, 1.3, 2.1, 2.2 3.1, 3.2 4.1	50%	5.5	S1 Week 4 S2 week 23