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**Genetics and Public Health**

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<td>dr. L. Henneman</td>
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<tr>
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<td>dr. C.G. van El, prof. dr. M.C. Cornel, dr. L. Henneman</td>
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<tr>
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**Doel vak**

1. The student can explain that some disorders develop according to Mendelian principles of inheritance (and knows exceptions to Mendel's laws), but that genetics plays a different role in many disorders that are important to public health (such as cancer, cardiovascular disorders, diabetes mellitus);
2. The student can describe how and where in the health care setting genetics/genomics is used (clinical genetics, public health, genetic screening, preconception care). Also, he/she can describe the different goals of public health versus clinical genetics, and the ethical dilemmas this raises;
3. The student can explain that tailored prevention is of clinical benefit, in particular when there is interaction between gene(s) and environment;
4. The student can explain how knowledge of genetics/genomics can be implemented in health care and what challenges can be expected.

**Inhoud vak**

Different topics that will be addressed:

- Different ways in which variations in DNA/chromosomes lead to disease;
- Population genetics, gene-environment interactions, epigenetics;
- Healthcare in relation to genetic disorders (clinical genetics, genetic screening, preconception care);
- The impact of a hereditary disease on individuals, families and society;
- Genetic risk, psychological and behavioral aspects of genetics;
- The tension between public health and (clinical) genetics;
- Ethical, legal, historical and social aspects of genetics;
- Challenges in the translation of science (new genetic knowledge) into public policy and healthcare;
- Criteria for (useful) genetic testing and genetic screening, Direct-To-Consumer genetic testing;
- New possibilities and challenges regarding whole exome and whole genome sequencing;
- New developments regarding gene editing and (ethical) dilemma's.

**Onderwijsvorm**

- (Working) Lectures (30 hrs);
- Subgroup sessions; Discussions in small groups about topical themes with regard to public health and genetics (6 hrs), and oral presentations by students (6 hrs);
- Individual assignments and group assignment in which the students work...
together describing the translation of a particular genomics application into healthcare (self-/group study).

**Toetsvorm**
Written examination in English consisting of open and multiple choice questions, based on the lectures and the provided literature (70%), a written report (20%), and an oral presentation (10%). Examination, Report, and Presentation should all three be passed (grade 5.5 or more). Students can only pass if they meet the presence requirements.

**Literatuur**
A course reader will be available online; additional literature (articles) will be announced on Canvas shortly before the course starts.

**Aanbevolen voorkennis**
Basic genetics

**Doelgroep**
This is a course in the Health Sciences minor Biomedical Topics in Healthcare. The course is open to both Health Sciences students and Biomedical students from VU University Amsterdam. Students from other universities and doing a similar educational track are also invited to participate. The minor is not recommended for VU Health and Life Sciences students. We have a maximum of 65 students.

**Intekenprocedure**

**Overige informatie**
Course coordinator:
L. Henneman, PhD, Dept of Clinical Genetics, VUMC
Other teachers in this course are:
Prof. M.C. Cornel, PhD, Dept of Clinical Genetics, VUMC
C.G. Van El, PhD, Dept of Clinical Genetics, VUMC

Among the guest lecturers are:
Q. Waisfisz, PhD, Dept of Clinical Genetics, VUMC
T. Rigter, PhD, Dept of Clinical Genetics, VUMC
S. Tamminga, Dept of Clinical Genetics, VUMC
K. Meeks, Dept of Social Medicine, AMC
Prof. M. Mannens, PhD, Dept of Clinical Genetics, AMC

[Dit vak is onderdeel van een minor en heeft een maximaal aantal deelnemers. Studenten die de hele minor doen, hebben voorrang.]

Heart Failure and Therapy

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<td>Fac. der Aard- en Levenswetenschappen</td>
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<tr>
<td>Coördinator</td>
<td>dr. D.W.D. Kuster</td>
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</table>
Doel vak
This course aims to provide further insights into the pathophysiologic mechanisms, diagnostic approaches and therapies and societal impacts of cardiovascular diseases.

Inhoud vak
Cardiac diseases that will be highlighted include inherited cardiomyopathies, diastolic heart failure and ischemic heart disease.

Both preclinical scientists and clinicians will give an overview of:
- The underlying pathomechanisms;
- The diagnostic criteria;
- The current pharmacological and non-pharmacological clinical interventions
- Which hypotheses might lead to novel insights into the treatment of cardiac diseases;
- The societal aspects and impact of the cardiac diseases.

Onderwijsvorm
The course will consist of lectures of experts in their field, group assignments, presentations and visits to the physiology department and the catheterization lab in the clinic. During the group assignments, each group of students will write a grant proposal about a cardiac pathology. Please note that the first day of the course, presentation of the group assignment and the lab visits are mandatory.

Toetsvorm
Written examination in English consisting of open and multiple choice questions, based on the lectures and the provided literature (70%), a written report (20%), and an oral presentation (10%).

Examination, report and presentation should all be passed (grade 5.5 or more).
Students can only pass if they meet the attendance requirements.

Literatuur
A syllabus will be provided at the start of the course on Canvas.

Aanbevolen voorkennis
Some basic knowledge on cardiac physiology is expected. For instance reading the chapter on Cardiac Function in Vander's Human Physiology or a similar textbook

Doelgroep
This is a course in the Health Sciences minor Biomedical Topics in Healthcare. The course is open to both Health Sciences students and Biomedical students from VU University Amsterdam. Students from other universities and doing a similar education are also invited to participate. The minor is not recommended for Health and Life Sciences students.
Overige informatie
Coordinators of this course are dr. D.W.D. Kuster and Prof Dr. J. van der Velden and (e-mail addresses: d.kuster@vumc.nl and j.vandervelden@vumc.nl)

This course is part of the minor Biomedical Topics in Healthcare and has a maximum number of participants. Students who follow the complete minor have priority.

Neurological and Psychiatric Disorders

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<tr>
<td>Coördinator</td>
<td>dr. T. Pattij</td>
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<td>dr. T. Pattij</td>
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<tr>
<td>Docent(en)</td>
<td>dr. A.M.W. van Dam, dr. T. Pattij</td>
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Doel vak
This course aims to provide further insights into the neurobiological mechanisms, diagnostic approaches and therapies and societal impacts of various neurological and psychiatric disorders.

Inhoud vak
In the course disorders that will be highlighted include Multiple Sclerosis, Parkinson’s disease, Alzheimer’s disease, brain tumors, cerebrovascular accidents, ADHD, Asperger/PDD-NOS, Autism and Obsessive Compulsive disorders.

Both preclinical scientists and clinicians will give an overview of:
- The underlying biological mechanisms;
- The diagnostic criteria;
- The current pharmacological and non-pharmacological clinical interventions
- Which hypotheses might lead to novel insights into the treatment of the disorder;
- The societal aspects and impact of the disorder.

Onderwijsvorm
Lectures, a debate session, project group assignment and presentations thereof, and a site visit to a nursing home will be offered. In addition, students have ample time to study during the course before the exam, and will be offered an Ask-the-teacher meeting the day before the exam. Please, note that the first day of the course, the debate session, the presentation of the project group assignment and the site visit are obligatory parts of the course.

Toetsvorm
Examination in the form of a written exam, a project group assignment and assignment presentations.

The exam consists of closed and open questions and is based on the lectures and the provided literature. The exam will count for 70% and the project group assignment for 30% of the final result. Exam and assignment should each be passed (grade 5.5 or more)

**Literatuur**
A digital e-syllabus will be offered on Canvas at the start of the course.

**Doelgroep**
Part of the minor Biomedical Topics in Health Care.

**Intekenprocedure**
Note that the first meeting on day 1 of the course is obligatory. Therefore, untimely registration leads to exclusion from this course.

**Overige informatie**
Coordinators of this course are dr. A.M.W. van Dam and dr. T. Pattij (e-mail addresses: t.pattij@vumc.nl and amw.vandam@vumc.nl).

This minor course requires a minimum of 25 participants to take place.

**Guest lectures**
The lectures will be given by a variety of teachers who are mostly associated with various departments within the VU medical center as a medical doctor or scientist (e.g. Neurology, Pathology, Anatomy and Neurosciences, Physiotherapy). External teachers come from Reade (rehabilitation institute Amsterdam), or VU University (Dept. Developmental Psychology)

Dit vak is onderdeel van een minor en heeft een maximaal aantal deelnemers. Studenten die de hele minor doen, hebben voorrang.

**Oncology and Public Health**

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<tr>
<td>Coördinator</td>
<td>dr. L.M. Buffart</td>
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**Doel vak**
The final terms of the course ‘Oncology & Public Health’ are:
1. the student is able to recall basic principles of tumor development and progression, diagnosis and treatment.
2. the student can describe basic public health related issues in
oncology, screening programs AND cancer epidemiology.
3. the student can explain the late effects of cancer diagnosis and treatment, and consequences on physical, psychosocial and occupational function and quality of life, and of possible intervention strategies managing these consequences and their effectiveness
4. the student can illustrate patients’ experiences and point out translation of research into clinical practice.
5. the student is able to identify a relevant Oncology & Public Health problem for an assigned tumor type, to formulate a research question, able to find answers to this research question in the scientific literature, rate the quality of studies and systematically report the results.

Inhoud vak
More than 3 million new cases and 1.7 million deaths every year make cancer one of the most frequent causes of mortality and morbidity in Europe. In the Netherlands, over 100,000 people are diagnosed with cancer every year (www.cijfersoverkanker.nl). The course ‘Oncology & Public Health’ focuses on oncology, from a “cell to society” perspective. Plenary lectures will be provided by the experts in the field of Oncology & Public Health both from the VU University, VU University Medical Center, including the Cancer Center Amsterdam, and from other universities and organizations, such as the Netherlands Cancer Institute (NKI-AVL). The lectures aim to transfer basic knowledge about the relevant topics in the field of oncology starting with basic knowledge on oncogenesis, cancer detection and treatment as well as cancer epidemiology. Throughout the course, there is a shift towards a societal perspective, with more emphasizes on the late effects of cancer and its treatment, and rehabilitation and supportive care issues. Preventive strategies and the effectiveness of various interventions reducing adverse effects of cancer and cancer treatment, and aiming to improve the quality of life of cancer survivors will be discussed. According to the National Coalition of Cancer Survivorship (NCCS), a cancer survivor is defined as any person diagnosed with cancer, from the time of initial diagnosis until his or her death. To highlight the issues that cancer survivors are facing, during primary cancer treatment, as well as after completion of treatment and during long term survivorship (e.g., returning to work), three cancer survivors will share their experiences with the students, and 3 practical translation lectures are included. Finally, the students will work on a concise literature study answering an important research question on an Oncology & Public Health issue, from the viewpoint of their assigned tumor type.

Onderwijsvorm
- Lectures (approximately 25) will be provided by guest teachers who are experts in their field. Via these lectures, students will increase their knowledge on oncology from the cell-to-society perspective. Additionally, some of these lectures include a patient presentation, in which students can interview the patient, and some lectures reflect translations into practice via, for example, a case study.
- 3 work groups (compulsory) and 3 consultancies are scheduled aiming to support students with writing of literature review.

Toetsvorm
The examination of Oncology & Public Health consists of four parts: assignment (review), oral presentation, reflection report and exam. The assignment and the exam will account for 30% and 70% of the final mark, respectively.
The oral presentation is compulsory to attend for all students. Both the oral presentation and the reflection report need to be sufficient. For the proposal and the exam, a mark from 1 to 10 will be given. Any mark below 5.5 cannot be compensated by higher marks, i.e., when one of the two marks is below 5.5, a re-examination or additional assignment is necessary.

**Literatuur**
Study material of this course is based on selected chapters of several books, and complemented with relevant scientific publications. Students will be able to download study material from the library or it will be placed on Canvas.

Two examples of the included books are:
- Basics of Oncology, from Stephens and Aigner.
- Handbook of Cancer Survivorship, from Feuerstein.

**Aanbevolen voorkennis**
This course has a public health focus. Students with a more biomedical background should take this into account.

**Doelgroep**
This course of the minor Biomedical Topics in Health Care is open to both Health Sciences students and Biomedical students from VU University Amsterdam. Students from other universities and doing a similar education are also invited to participate. The minor is not recommended for Health and Life Sciences students.

**Intekenprocedure**
Please sign up for this course prior to the first opening lecture. In addition, students have to self-enroll in a work group corresponding to a specific tumor type via Canvas prior to the first opening lecture. Students who are not assigned to a work group after the first day will not be able to participate in the course.

**Overige informatie**
Course coordinator:
Dr. L. Buffart, PhD. VUmc, Department of Epidemiology and Biostatistics and Medical Oncology
Dr. E. Ruhé, PhD. VUmc Cancer Center Amsterdam

Dit vak is onderdeel van een minor en heeft een maximaal aantal deelnemers. Studenten die de hele minor doen, hebben voorrang.

**Toxicology and Neurodevelopment**

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<tr>
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<td>prof. dr. S. Spijker</td>
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<tr>
<td>Docent(en)</td>
<td>prof. dr. S. Spijker</td>
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Doel vak
To obtain knowledge about human development, as well as the effects of toxicological agents on the life-time course of human development (pre- and post-natal, including adolescence). Specifically, we study important cascades of genes that play a pivotal role in development and that can be disturbed due to toxicological agents. Furthermore, we will focus on how this information can be related to detection of toxicological agents using state-of-the-art molecular techniques. The course is a combination of plenary lectures, hands-on practical work using zebra fish embryos, a workshop on gene expression analyses, and a visit to the collection of the ‘Vrolik Museum’ at the Amsterdam Medical Center (AMC).

Inhoud vak
In the first week basal knowledge about human development (meiosis, mitosis, fertilization, first weeks of development) and toxicology (dose-response curves, bioassays, biotransformation) is given. Then, using examples of different model organisms, we will take a closer look at prenatal development (embryonic and fetal) of various organs and the influence of teratogens, such as industrial by-products and agents of substance abuse (nicotine, cocaine). You will even test the consequences of such teratogens yourself on the well-known model of zebra fish development.
Furthermore, we focus on signaling cascades that are important and that can be perturbed by these agents. As such, we will go into genomics techniques to determine the effect of these agents at the cellular level. In the third week, we will check out the development of the brain and concentrate on cognitive aspects of postnatal development (from birth to teenage) and agents that could influence our abilities at this late stage of development.
Practicals include normal and perturbed embryonic development of zebra fish, and a bioinformatics workshop on measurement of gene expression levels of relevant genes that target body axes and limb formation. We will visit the Dutch ‘Vrolik’ collection of embryos and anatomical abnormalities in the AMC; be surprised of how much you have learned already in week 3 of the course!
All and all, integration of the knowledge gathered from the practical and the workshops is assessed by an oral presentation.

Onderwijsvorm
Lectures, practicals and small meetings for discussion

Toetsvorm
Presentation practicals (30%), and written exam (70%). For both, it is required to obtain a minimum grade of 5.0 to pass, and a final grade of 5.5.

Literatuur
Langman’s Medical embryology 12th edition (or up)

Doelgroep
3rd year GZW, not advised for BMW and G&L
**Intekenprocedure**
Register 3 weeks before the start of the course, otherwise you cannot participate due to the preparation we have in terms of the practical. Also, in case you registered but do not participate in the end, please drop us an e-mail, so we know :) 
There is a maximum of 60 students, first comes first served.

**Overige informatie**
This minor course requires a minimum of 25 participants to take place 
There is a maximum of 60 students, first comes first served.

This course is part of a minor and has a maximum number of students. 
Students who follow the entire minor have priority.