As part of the first semester of year 3 of the bachelor program (September- January) an English taught minor of 24/30 ECTS is offered to all student, including (international and national) students of partner institutions of VU and VUmc.

The minor program at VUmc consists of a general introductory course followed by different tracks of choice each consisting of three individual courses. The tracks cover a wide variety of subjects such as Internal Medicine, Cardiovascular Diseases, Infection and Immunology, Neurology and Psychiatry, Global Health, Clinical Epidemiology, Surgery, Child Health Care, Medical Technology, Healthy Ageing and Human Movement Sciences. At the end of this semester, students are expected to write a bachelor thesis on a topic of choice.
### Inhoudsopgave

<table>
<thead>
<tr>
<th>Minor Optional Modules</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Vak: Cardiovascular Research Challenges (Semester 1)</td>
<td>1</td>
</tr>
<tr>
<td>Vak: Child Healthcare (Semester 1)</td>
<td>3</td>
</tr>
<tr>
<td>Vak: Clinical Neuroscience-Life of Brain (Semester 1)</td>
<td>6</td>
</tr>
<tr>
<td>Vak: Death and dying: clinical, scientific and ethical challenges (Semester 1)</td>
<td>7</td>
</tr>
<tr>
<td>Vak: Global Health, Indonesia (Semester 1)</td>
<td>9</td>
</tr>
<tr>
<td>Vak: Global Health Diversity &amp; Conflict (Semester 1)</td>
<td>13</td>
</tr>
<tr>
<td>Vak: Hot Topics in Psychiatry (Semester 1)</td>
<td>17</td>
</tr>
<tr>
<td>Vak: Immunology-Infection-Cancer Connected (Semester 1)</td>
<td>23</td>
</tr>
<tr>
<td>Vak: Internal Medicine (Semester 1)</td>
<td>27</td>
</tr>
<tr>
<td>Vak: Minor Literature Essay (Semester 1)</td>
<td>29</td>
</tr>
<tr>
<td>Vak: Peri-operative Care and Anatomy (Semester 1)</td>
<td>31</td>
</tr>
<tr>
<td>Vak: Personalized Medicine (Semester 1)</td>
<td>32</td>
</tr>
<tr>
<td>Vak: Research Minor: Science in Medicine (Semester 1)</td>
<td>34</td>
</tr>
<tr>
<td>Vak: The Moving Body-in Health and Disease (Semester 1)</td>
<td>37</td>
</tr>
<tr>
<td>Vak: Translational Sciences in Medicine (Semester 1)</td>
<td>40</td>
</tr>
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Minor Optional Modules

Vakken:

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<td>18.0</td>
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<td>M_BGHI17</td>
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<td>M_BPCIA16</td>
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<td>M_BPM16</td>
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<td>Semester 1</td>
<td>18.0</td>
<td>M_BRMSM16</td>
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<tr>
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Cardiovascular Research Challenges

| Vakcode                         | M_BCVRC16 () |
| Period                          | Semester 1   |
| Credits                         | 18.0         |
| Voertaal                        | Engels       |
| Faculteit                       | VUmc         |
| Coördinator                     | prof. dr. J. van der Velden |
| Examinator                      | prof. dr. J. van der Velden |
| Lesmethode(n)                   | Hoorcollege, Practicum, Studiegroep |
| Niveau                          | 300          |

Inhoud vak

Selected topics on cardiovascular diseases, their origin and development, diagnoses and treatments are presented and discussed. The students will design a research proposal for future research based in past research within the Cardiovascular Research field. This research proposal is for a student’s project of 4 month full time research, and could be the basis of their own project in the future.
Course objective

After the first course the student can explain the following topics:
Heart failure and arrhythmias
The differences between HFpEF and HFrEF
The link between diabetes and vascular problems
Diabetic cardiomyopathy
Causes of Arrhythmia
Cellular aspects of Heart failure
The Pressure/Volume relation of the heart in normal and failing hearts.
After the first course the student can find, present and discuss:
scientific publications with colleagues
After the second course the student can explain the following topics:
Functional Imaging of heart diseases by PET/MRI and Echo
Atherosclerosis and CAD: Cellular, functional and clinical consequences (heart and brain)
Endothelial function and angiogenesis
Use of animal models in CV research
How to measure basic cardiovascular functions in humans (heart rate, blood pressure, cardiac output, ventilation etc.)
After the third course the student can explain the following topics:
Interaction between heart and lungs in PAH, exercise, mechanical ventilation and altitude
Interaction between kidney and heart in dialysis, exercise and disease

Each student will write a research proposal on a new research topic in cardiovascular disease according to a preset format.

Toetsvorm
Course 1:
1. Presentation by the student of an original published cardiovascular journal article. (20%)
2. Open questions written examination (2 hrs) (80%)
Course 2:
1. Oral presentation of research idea and possible measurements (20%)
2. Open questions written examination (2 hrs) (80%)
Course 3:
1. Written research proposal in a predefined format (80%)
2. Oral presentation of own research proposal (20%)

Reassessment: When one or more courses are not sufficiently graded it can be compensated by a 7.0 or higher for one of the other courses (as long as the final course result is not below 5.0),
When the final course result is below 5.0, the full course (written and oral parts alike) will be reassessed by an oral examination, testing the knowledge and understanding of the topics of the course. When more course results are below 5.5, all these courses will be reevaluated in this oral exam.

Literatuur
An overview of the study material is placed on CANVAS.

Vereiste voorkennis
Basic knowledge of Heart and Circulation, Physiology and anatomy
Course reading
An overview of the study material is placed on CANVAS, mostly scientific articles on the subjects discussed.

Target audience
Bachelor students of VUmc School of Medical Sciences and (international) students, with a biomedical background.

CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Register
All students who enrolled into the International Minor in Medical Sciences are registered by the IOO for educational activities for this course and exams. If you want to re-take an exam, you will need to apply in time for the exam through the form Re-take exam Bachelor of Medicine.

Aanbevolen voorkennis
Basic knowledge of Heart and Circulation, Physiology and anatomy

Doelgroep
Bachelor students of VUmc School of Medical Sciences and (international) students, with a biomedical background.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure
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Overige informatie
Coordinator:
Prof dr. J. van der Velden and dr. I. Vergroesen
Examinator:
Prof dr. J. van der Velden

Child Healthcare

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Course Content
This module is divided into 3 subcourses and deepens the knowledge obtained in the Major, most specifically in the courses "Start of life" (Start van het leven) and "Growth and development" (Groei en ontwikkeling). It comprises current research topics in pediatrics and the challenges and differences in healthcare from babies to adolescents when compared to adult medical and psychiatric care.

Course 1: Current research in Pediatrics
Research on and with children comes with very specific challenges. The aim of this course is bridging the gap for students between clinical practice and research. It provides insight in normal development of children and in some specific diseases and disorders in children and adolescents. It presents current world class clinical and translational research in pediatrics and shows students how scientific research is translated into clinical practice and how patient care generates research questions.

In each week of this course the latest developments in a specific pediatric research field is represented. There will be focus on the current insights in the role of the microbiome in health and disease and infectious diseases, research in neurometabolic and neurogenetic disorders. Finally, the pediatric oncology department gives a view on their clinical trials, laboratory studies and long term effects in childhood cancer survivors.

Course 2: Food and health/pediatric threats and support
In this course, we will address at the molecular level the underlying biochemical and immunological effects of dietary composition and endocrinology on metabolism at the molecular level, and highlight the solid basic and clinical evidence on the sense and non-sense of health claims of specific diets. Laboratory and animal research to understand the basic mechanisms of normal and abnormal development will be discussed, and their impact on neonatal care in health and disease, including child intensive care. The difference in dietary requirements between adults and children will be addressed. "Failure to thrive" is seen in hospitalized infants and children caused by several underlying diseases and inefficient nutritional management, as severely ill patients have altered dietary requirements, leading to malnourishment even in hospitals. In addition to these acquired metabolic derangements, we will address the effects of in-born monogenetic disorders of metabolism and endocrinology as well as their diagnosis and treatment.

Course 3. Child Public Health
Why is Child Public Health so important? A wide range of diseases has, at least in part, a childhood origin - for example obesity and hypertension - and these diseases track into adulthood. Furthermore many problems encountered in childhood can have serious long term consequences e.g. child neglect and child abuse. Prevention and early
recognition of these disorders is therefore of the utmost importance. The course will start with defining Child Public Health including the determinants and interweaving factors that influence child health. We will continue with a choice of several Child Public Health topics and study them interactively with research as the leading theme. During interactive lectures, workshops and visits we will discuss determinants and early recognition of pediatric public health issues, growing up in a problematic environment, health risk (behavior) in adolescence and public health challenges in the tropics. Within these topics we will explore different epidemiological concepts, intervention development and evaluation including the potential of participatory research with children. In addition in several workshops we will guide you in the process of writing your own research proposal on a pediatric topic of your choice.

Course objective

Course 1
The aim of this course is bridging the gap for students between clinical practice and research. After this course, the student can reproduce the specific challenges and disease background in pediatric clinical care, specifically in neurology, gastro-intestinal disease, oncology and infectious disease and can explain how research questions arise from clinical problems and formulate relevant research questions and hypotheses in the area of pediatrics.

Course 2
After this course, the student can describe the effects of metabolic disorders and diet during early life on the development and function of different organ systems, including the immune system. The student can explain the concept of failure to thrive and reflect on translation between laboratory findings/animal experiments and clinical research.

Course 3
After this course, the student can reproduce the definition, determinants and indicators of Child Public Health, can explain and reflect on the meaning and implications of “tracking” and explain the importance and identify the successes and pitfalls of prevention programs. The student can also identify, describe and reflect on successes and pitfalls of different study designs and in analyzing and reporting study results and describe the translational links between research and clinic on the specific topics in Child Health Care presented during the course.

Toetsvorm
Each subcourse will be examined with a written exam with open question and a writing assignment, like a critical appraisal of a topic. Both assessments are equally weighed.

Literatuur
An overview of the study material is placed on CANVAS.

Doelgroep
Minor students of VUmc School of Medical Sciences.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will
automatically have access to the CANVAS course.

**Intekenprocedure**
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**Clinical Neuroscience-Life of Brain**

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<td>Coördinator</td>
<td>dr. M.M. Schoonheim</td>
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<td>Examinator</td>
<td>dr. M.M. Schoonheim</td>
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<td>Niveau</td>
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**Inhoud vak**
The human brain is formed by a very complex and mysterious network of neurons. Even relatively mild damage to this network can have a very large and lasting impact on the daily lives of patients. In this minor, you will be guided through the brain as we age, focusing on common (and uncommon) neurological disorders in each stage of life. The three courses are Pediatric Neurology, Adult Neurology and Neurodegeneration.

Topics include childhood white matter disorders, multiple sclerosis, neuro-oncology, epilepsy, fronto-temporal dementia, Parkinson and Alzheimer’s disease, amongst others. For these disorders, you will gain the latest scientific insights into histopathological and neuroradiological findings and techniques, clinical symptoms and treatment strategies in this dynamic and important field of medicine. You will look at brain tissue under the microscope, MRI scans to find damage in-vivo and learn to interpret advanced imaging techniques that measure brain functioning.

You will learn to combine different research fields to become a "translational neuroscientist". You will apply these skills into a critical appraisal, opinion paper, research proposal and ethical debates in the exciting field of neurology.

**Course objective**
Objectives for all three courses (Pediatric Neurology, Adult Neurology and Neurodegeneration):
1. To investigate the latest neuro-scientific literature and scientific methods in order to study neurological disorders
2. To learn how to analyze and critically assess the value and relevance of neuro-scientific papers
3. To learn how to combine findings from different fields of science in order to write and present a critical appraisal of a topic, an opinion paper and a translational research proposal.

**Toetsvorm**
Open-ended-questions exams, writing assignments, presentations and debate.

**Literatuur**
An overview of the study material is placed on CANVAS.

**Aanbevolen voorkennis**
Knowledge on neuroanatomy and neurophysiology is recommended.

**Doelgroep**
Target audience
Minor students of VUmc School of Medical Sciences.

**Uitleg in Blackboard/Canvas**
CANVAS
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**Intekenprocedure**
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**Death and dying: clinical, scientific and ethical challenges**

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<td>Coördinator</td>
<td>prof. dr. G.A.M. Widdershoven</td>
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<td>prof. dr. G.A.M. Widdershoven</td>
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**Inhoud vak**
In the last phase of life, in many cases, end-of-life decisions have to be made. In this track the clinical, scientific and ethical aspects of these decisions will be investigated. Clinical, scientific and moral challenges surrounding quality of life and patient participation in end of life decisions are hot topics in present day health care. This minor track provides insight into these challenges from a multi-disciplinary perspective. The minor track consists of three courses.

1) Treatment decisions, teacher: dr. J. Zijlstra
2) Palliative care and quality of life, teacher: prof. dr. B. Onwuteaka-Philipsen
3) Euthanasia and other end-of-life decisions, teacher M. van Loon, Msc. Mphil

The track will contain various educational methods, including lectures, group work, presentations, meet the expert (e.g. SCEN physician, medical specialists; palliative care consultant), skills training visits to clinical practice. During the track, students will follow an individual patient or a physician in a palliative care setting.

Course objective
Learning objectives (knowledge and skills);
- Research knowledge and skills
- Clinical knowledge and skills
- Communication skills, especially talking about the end of life
- Reflection on own attitudes towards death and dying
- Ethical reflection and moral case deliberation

Toetsvorm
Participation and student presentations, preparing questions for discussion
Written exams; for course 1 and for course 3 students are required to write an essay
In each course, the students will present, and write a final essay.

Literatuur
An overview of the study material is placed on CANVAS.

Aanbevolen voorkennis
Knowledge of basic medical science comparable to the end level of bachelor 2 is mandatory to participate in this track.

Doelgroep
Minor students of VUmc School of Medical Sciences;
Students from Health and Life sciences;
Students from abroad

Uitleg in Blackboard/Canvas
CANVAS
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Global Health, Indonesia

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Inhoud vak
This module builds on recent developments and practices within the fields of Global Health, the Healthcare system in Indonesia and research and places them in a broader perspective (e.g. psychological, societal, managerial, political and economic).

In this module, students acquire experience in research and practices in developing countries (low and middle income countries) with regard to health care and culture. They will also obtain insight into the practice of health care in Indonesia from Health Centre to hospital and outpatient clinic. The students will obtain a strong focus on health issues in community life outside of the hospital and prevention,

The module consists of the course Global Health followed by a two month program in Indonesia in collaboration with the Gadjah Mada University in Yogyakarta (Universitas Gadjah Mada, UGM).

The course Global Health is a course with a broad spectrum of topics from a global perspective. The course focuses on low- and middle-income countries with a high burden of disease. People live in resource-poor settings, with weak health systems. This demands for specific strategies to prevent illness and effectively deal with problems like child diseases, malnutrition and safe motherhood.

After this course, students participate in a two month program in Indonesia. The Indonesia program consists of one month in Yogyakarta and one month in the field. The program in Yogyakarta will cover lectures, case studies, ward observation visits in hospital, outpatient clinic visits. Further the students carry out a research in one of the demand driven topics. In this way, students will obtain a better insight into the everyday world of the culturally diverse patient. The topics which can be chosen from are: Water and sanitation (WASH); TBC/HIV; Mother and Child care; Life style (prevention); Tropical diseases (malaria/dengue); Dermatology.
Structure of the module

The total program of the Module Global Health Indonesia lasts 3 x 4 weeks (18 ECTS).
In the first 4 weeks (6 ECTS) of the module, the students follow the course Global Health (October).
Next, the students travel to Indonesia for an 8-week program (12 ECTS (November / December).

Course Global Health

The Global Health course offers lectures from researchers and global health practitioners from different scientific backgrounds like clinical, public health, epidemiology, social sciences, medical anthropology and biomedical sciences. The lectures cover global health in view of the United Nations Sustainable Development Goals (SDGs), notably: Health (SDG 3), Gender equality and women’s empowerment (SDG 5), Water and Sanitation (SDG 6) and Sustainable consumption and production (SDG 12). Topics covered are: Health systems, Blindness, Malaria, Tuberculosis, Leprosy, Child diseases, Gender and health, Nutrition, Sexually Transmitted Diseases, HIV and AIDS, Safe motherhood, Mental health, Disability, Female genital mutilation, Water and sanitation, Tropical medicine, Neglected diseases, Essential surgical care, Environment and health, Access to medicine and Female cancer. In the lectures interactive case studies are presented. These will give students a better understanding of the interaction between theory and practice in a global health context.

Next to the lectures, in 7 tutorials, the knowledge on qualitative research methods will be deepened.
The focus of the tutorials is on qualitative research methods for instance photo voice and lifelines.
During the tutorials, the students write a research proposal. For the participants in the Global Health Indonesia module, predefined topics are available based on demands from participating community health centres (Pusat Kesehatan Masyarakat - Puskesmas), in consultation with UGM.

The students may combine different scientific approaches (as mentioned above) in their proposal. Students will make use of scientific publications to formulate a research question and will present their work orally and in writing. In this way the students practice interdisciplinary methods to obtain a better view on global health, diversity or conflict area problems.

Content program in Indonesia

Right after the completion of the course Global Health, students travel to Indonesia.
The program consists of 8 weeks of activities including lectures, case studies and hospital visits where students will observe patients during the ward rounds. Students are not allowed to perform any clinical procedures. Furthermore the student will execute a research assignment. The lectures and case studies provide knowledge and information about internal medicine, paediatric, and obstetrics & gynaecology in relation with tropical medicine and infectious diseases as the main problem in
Indonesia, including the epidemiology, diagnosis, and management. Aside from the infectious diseases, non-communicable diseases in the context of developing countries are covered. During the ward and community health centre visits, students observe the Indonesian health system in practice and the basic concepts of community medicine.

As indicated above, for the research assignment the research proposals are already written in The Netherlands during the course Global Health. Students will visit a Puskesmas, to obtain basic information. Furthermore they travel to the communities surrounding the Puskesmas as part of the field work, to conduct interviews. In this way students execute a research project and implement it as a group working with district health management teams. In the field, students will work together with Indonesian and foreign students.

Learning objectives course Global Health

Learning objectives course Global Health include the following:
1. The student can identify the influence of urbanization, climate change, ageing, reduced poverty, increased mobility and migration, emerging patterns of diseases and new technologies on health and healthcare in different parts of the world. Student is able to apply this knowledge in case studies in low-, middle income countries and emerging economies.
2. The student can discuss and explain issues related on interventions on child diseases maternal and female health
3. The student can describe and discuss the sustainable development goals related to health; issues on communicable and non-communicable diseases related (Global burden of disease) to international policy and practice in response to the global changes. Can discuss the presence of different health systems and water systems for a health population
4. The student can discuss and explain the presence and difference in health systems, water systems and environment for a healthy population.
5. The student knows how and when to apply the qualitative research method, can apply several Qualitative research methods and can analyse qualitative data.
6. The student is able to develop and present a qualitative research proposal that meets the criteria of scientific research; is able to formulate a research question based on literature and can critically analyse publications.

Learning objectives program in Indonesia:

Learning Objectives for the 8 week program in Indonesia include:
1. Student is able to execute a scientific research based on a research proposal previously written
2. Student is able to present research results
3. Student observes medical practice in a hospital in Indonesia (Internal Medicine, Mental Health, Obstetrics & Gynaecology, Paediatrics, Pulmonology & Respiratory Medicine, Community Medicine)
4. Student can discuss and explain current health issues in Indonesia (Health system in Indonesia from the community to district level facilities, global health perspective, internal medicine, mental health, Obstetrics & Gynaecology, Paediatrics, Pulmonology & Respiratory Medicine, Community Medicine)

Toetsvorm
Type of assessment

Examination of the course Global Health consists of the following elements:

- Research proposal / Students presenting their proposals – this should be sufficient to pass to the program in Indonesia – grade > 5.5
- Final examination (open questions - CAT) this should be > 5.5

The course grading provides 33% of the overall module grade.

Important: Please mind that in case you won’t pass the exam you’ll not be automatically registered for a re-examination. In order to sign up for a resit, you’ll need to send an email to studentbalie@vumc.nl Make sure to do this before the final registration date (which is two weeks before the re-examination).

Examination of the program in Indonesia:

- Two assignments – these will be graded sufficient / insufficient;
  - if insufficient repair is needed:
    - Patient interview in hospital / outpatient clinic
    - Patient interview in local health centre
- Grading of the research process, research report and its presentation will be the final grading of the 8 week program in Indonesia. Minimum should be an average of 5.5.
  - Research process 30%.
  - Research report 50%
  - Research presentation 20%

The research grading provides 67% of the overall module grade.

Literatuur

An overview of the study material for the Global Health course will be placed on CANVAS. For the Indonesia program the literature will be provided in collaboration with UGM.

Doelgroep

Target group for this Minor module Global Health Indonesia are 3rd year Bachelor students from VUmc.

Uitleg in Blackboard/Canvas

CANVAS

This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure

Before the start of the semester students will be invited to indicate their preferred minor module, however the Institute of Education and Training (IET) will make a final selection based on both student preferences and availability in the different tracks. Once you have been selected for a module, the administration of IET will make sure you are registered for all educational activities such as study groups, courses and exams. Please mind that in case you won’t pass the exam you’ll not be automatically registered for a re-examination. In order to sign up for a resit, you’ll need to apply in time (which is two weeks before the re-examination) for the exam through the form Re-take exam Bachelor of Medicine.
Overige informatie
Number of students

A limited number of students (10-12) can be placed in the Minor module Global Health Indonesia. The application procedure for this module is selective and selection will be based on an assignment, motivation and grades.

Practical information

When selected, the costs of the tuition fee at UGM will be covered by VUmc, but flight tickets, accommodation, insurance and living costs will be at your own expense.

GlobalHealth Diversity & Conflict

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Inhoud vak

This module builds on recent developments and practices within the fields of Global Health, Gender and Diversity and Health Care in Conflict Areas and places them in a broader perspective (e.g. psychological, societal, managerial, political and economic).

Global Health is a course with a broad spectrum of topics from a global perspective. The course focuses on low- and middle-income countries with a high burden of disease. Here people live in resource-poor settings, with weak health systems. This demands for specific strategies to prevent illness and effectively deal with problems like child diseases, malnutrition and safe motherhood.

Gender & Diversity focuses on aspects of diversity from cell to (Western) society including sex and gender, cultural diversity, and class issues in health, research, and care.

Healthcare in Conflict Areas again has a global approach. This course elaborates on the role of health care professionals in situations of violence, conflict and war. Issues like the physical and psychological effects of violence and conflict, the medical consequences of weapons and the role of doctors with respect to human rights will be discussed. Connecting themes in this module are the position of women, mental health, and the role of structural factors in health and health care.

Course Global Health

The Global Health course offers lectures from researchers and global health practitioners from different scientific backgrounds like clinical, public health, epidemiology, social sciences, medical anthropology and biomedical sciences.

The lectures cover global health in view of the United Nations...
Sustainable Development Goals (SDGs), notably: Health (SDG 3), Gender equality and women’s empowerment (SDG 5), Water and Sanitation (SDG 6) and Sustainable consumption and production (SDG 12). Topics covered are: Health systems, Blindness, Malaria, Tuberculosis, Leprosy, Child diseases, Gender and health, Nutrition, Sexually Transmitted Diseases, HIV and AIDS, Safe motherhood, Mental health, Disability, Female genital mutilation, Water and sanitation, Tropical medicine, Neglected diseases, Essential surgical care, Environment and health, Access to medicine and Female cancer.

In the lectures interactive case studies are presented. These will give students a better understanding of the interaction between theory and practice in a global health context.

Next to the lectures, in 7 tutorials, the knowledge on qualitative research methods will be deepened.

The focus of the tutorials is on qualitative research methods for instance photo voice and lifelines.

During the tutorials, the students write a research proposal. This may be in one of the Global Health related Sustainable Development Goals, or on one of the topics of course 2 and 3 in this minor module: Gender & Diversity or Healthcare in Conflict Areas.

The students may combine different scientific approaches (as mentioned above) in their proposal. Students will make use of scientific publications to formulate a research question and will present their work orally and in writing. In this way the students practice interdisciplinary methods to obtain a better view on global health, diversity or conflict area problems.

Course Gender & Diversity

Health disparities and inequalities exist between men and women across (socio)cultural backgrounds, class, sexual orientation, abilities and age (intersectionality framework). To date, a sex/gender and diversity perspective is insufficiently incorporated in research from fundamental research to drug trials and in medical practice. To enhance excellence in medical research and practice, a systematic integration of diversity aspects is required at all levels and from cell to society.

Understanding the antecedents of differences and inequalities and their connections to biological and social processes is important to improve quality of health and health care for both women and men across their intersections with other aspects of diversity. In this course, we will give an in-depth overview of the relevance of these issues for clinical practice across a number of disciplines and health conditions. In week 1, we address among other issues sex (biological, e.g. genetic, hormonal) differences in basic sciences (e.g. genetics and cell biology) and musculoskeletal diseases. In week 2, we address the relationship between gender (sociocultural aspects of being male and female) and cultural/ethnic background to public health issues in particular lifestyle and cardiovascular diseases. In week 3, we will focus on gender, cultural/ethnic background and class (poverty and wealth) in relation to mental health particularly depression and stress, including gender, medical students and physicians, and their mental health. In week 4, we focus on the intersections between sex/gender, sexual orientation, (dis)abilities and cultural/religious background and how they relate to health and health care. Where relevant and possible we will address pharmacology and diversity as a cross-cutting theme, including drug development and women’s exclusion from trials, and adverse drug reactions and drug withdrawal from the market and ethnic differences in drug response.

Course Healthcare in Conflict Areas
Conflict and war have huge consequences for the health of people in conflict areas as well as for the health care system. In this course we will discuss the medical consequences of conflict and war, including the specific effects of atomic, biological, chemical and ‘conventional’ weapons. Subsequently the medical response is being discussed, including the role of organizations like the Red Cross and Doctors without Borders. International humanitarian law plays an important role in this context. The broader consequences of war and conflict for social and psychological welfare and the role of health care workers will be discussed. Finally, we will pay attention to the root causes of war and conflict and the role of doctors in these issues. The course consists of guest lectures and tutorials. These lectures are in part meant to get deeper insight in some of the issues, in part to illustrate these issues with the experiences of health workers in daily practice. In addition, there are seven tutorials. In seven tutorials specific issues related to the course content will be more intensively discussed based on Case studies.

Learning objectives

Module Global Health Diversity & Conflict

Overarching learning objectives of the module are for students to familiarize themselves with the broad range of topics related to the themes of the three courses. Furthermore the courses offer training in writing a quantitative research proposal and papers based on scientific literature.

Course Global Health

After the course, students can:
1. Explain the influence of urbanization, climate change, ageing, reduced poverty, increased mobility and migration, emerging patterns of diseases and new technologies on health and healthcare in different parts of the world. Are able to apply this knowledge in case studies.
2. Describe and discuss Sustainable Development Goals with a focus on Health, international policy and practice, in response to the global changes described above;
3. Apply several data collection and analytic skills, using the tools of demography, anthropology, sociology and epidemiology through case studies and scenarios;
4. Critically analyse scientific publications, theories, hypotheses and arguments, and justified and presented findings both orally and in writing;
5. Apply qualitative research skills;
6. Write a research proposal to apply qualitative or mixed methods research.

Course Gender & Diversity

After this course, students are able to:
1. Describe the meaning of sex/gender and other aspects of diversity for health and illness
2. Explain the role of sex/gender and other aspects of diversity for diagnose and therapy and present examples
3. Describe and explain the role of diversity in major health issues such as coronary heart disease and lifestyle and mental health problems and apply this knowledge to patient cases
4. Describe theoretical developments and concepts in the field of gender and diversity medicine including cultural competence, bias, gender awareness, diversity responsiveness
5. Explain the intersections of aspects of diversity in health and
6. Recognize and explain gender and diversity bias in research and practice and its consequences for clinical practice
7. Apply a gender and diversity lens to academic papers, research proposals, presentations

Course Healthcare in Conflict Areas
After this course the student can
1. Describe the relevance and content of some aspects of international human rights law, especially in the International Covenant on Economic, Social and Cultural Rights
2. Discuss the importance of international humanitarian law (the Geneva Conventions)
3. Outline relevant professional codes of conduct in the context of medicine, health and human rights
4. Describe the health effects of nuclear, radiological, biological and chemical weapons
5. Assess how effectively the threat posed by these weapons is being dealt with by the international community and what the role of health professionals is in these issues
6. Describe the key aspects of the history of war and medicine and how they are interrelated in different context
7. Understand how health and health care are influenced by war
8. Describe the needs of refugees and migrants related to their health and wellbeing
9. Understand the psychosocial impacts of the violent conflicts they may have escaped and the difficulties they are likely to have experienced during their journey into exile
10. Acquire skills in culturally sensitive health care provision and be able to analyze ethical dilemmas in relation to health and refugee work.

Toetsvorm
Type of assessment
For each of the three courses:
- Written exam (50%, minimum score 5.5)
  (Learning objective 1-3)
- Assignment (research proposal / paper)
  (50%).

For the 3 courses in the module Global Health, Diversity & Conflict, one 5 is allowed, provided that this is compensated by a score >= 7 in another course.

Literatuur
Course reading
An overview of the study material is placed on CANVAS.

Doelgroep
Target audience
Minor students of VUmc School of Medical Sciences and faculty of Life Sciences and other universities.

Uitleg in CANVAS
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course
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Intekenprocedure
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Toetsvorm
For each of the three courses:
- Written exam (50%, minimum score 5.5)
  (Learning objective 1-3)
- Assignment (research proposal/paper)
  (50%)

For the 3 courses in the module Global Health, Diversity & Conflict, one 5 is allowed, provided that this is compensated by a score >= 7 in another course.

Literatuur
An overview of the study material is placed on CANVAS.

Doelgroep
Minor students of VUmc School of Medical Sciences and faculty of Life Sciences and other universities.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure
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Hot Topics in Psychiatry
Doel vak
Globally, millions of people suffer from debilitating psychiatric disorders. At present, these disorders are incurable, which necessitates the development of advanced prevention strategies, diagnostic tools and treatments. In this module, you will gain insight in the latest developments in psychiatry research, as well an overview of the novel research methods (ranging from genome-wide association studies to neuro-imaging in patients). Topics: child- and adolescent psychiatry, forensic psychiatry, schizophrenia, autism, depression, and comorbid somatic and neurological conditions.

Course objective
You will gain insight in the latest developments in psychiatry research, as well an overview of the novel research methods (ranging from genome-wide association studies to neuro-imaging in patients). In addition, you will learn how to analyze and evaluate research papers, how to write an opinion article, and discuss ethical dilemmas in the field of psychiatry. Collectively, these courses will serve as an excellent preparation for the Bachelor’s thesis and the scientific internship (M1 or M3).

Hot topics in Psychiatry – Course 1: Crisis and Forensic Psychiatry

Course Content

What if all goes wrong and your patient becomes so seriously ill that he or she gets into a crisis situation or gets delirious? When a patient, despite all previous efforts to help him/her, becomes suicidal? When problems become that severe that a patient gets him- or herself into serious trouble? Or when he or she commits a criminal act?

This course forms the first course within the minor module Hot Topics in Psychiatry. During this course you get to learn about the most complex fields of psychiatry: crisis and forensic psychiatry in childhood and adolescence. As the course will be set up from a neurodevelopmetal perspective, the course starts form a child- and adolescent perspective, with links to adult psychiatry.

In week 1, we will start with the relation between serious somatic illness and psychiatry and vice versa, and consultative psychiatry, in week 2 the suicidal patient is central, including severe automutilation and autointoxication, in week 3 we focus on the threatened child that grows up in an aggressive and unsafe environment, in week 4 the delinquent is central, the patient that has severe behavioral problems like aggression, impulsivity and drug abuse, with focus on the role of psychiatric problems in the development of (persistent) delinquent behavior.
A patient or clinical case is always the starting point, and from that we will get into questions like: what neurodevelopmental mechanisms have led to this kind of complex problems? What environmental, psychological and neurobiological mechanisms are involved? What do we know from research about this type of patients? What further research is needed, and how could that be designed? What (evidence based) treatments are available?

Each week will consist of interactive lectures, work groups and an excursion (f.i. to a Closed psychiatric ward, Closed youth care institution, Juvenile justice institution)

Course objective

The student will learn to
(1) Describe and explain complex psychiatric problems in crisis and forensic psychiatry
(2) Describe and interpret (neurodevelopmental) risk factors for psychiatric problems in crisis and forensic psychiatry.
(3) Summarize, critically analyze and reflect on research papers in the field of crisis and forensic psychiatry.

Type of assessment
Short written assignments (mid-term) and written exam consisting of open-ended questions (final exam)

Hot topics in Psychiatry – Course 2: Psychiatric genetics

Course Content

This course provides a comprehensive overview of the current state-of-the art in the field of psychiatric genetics. It covers basic concepts like heritability and the difference between Mendelian and (genetically) complex disorders. We will extensively discuss recent results from genome-wide association and sequencing studies in psychiatric genetics. Finally, we will discuss the importance of state-of-the art techniques like pluripotent stem cell cultures (iPSC) for understanding complex disorders.

Course objective

The student will learn to
(1) explain the concept of (missing) heritability and interpret heritability estimates of psychiatric disorders
(2) explain the difference between Mendelian and (genetically) complex disorders and its implication for psychiatric genetics
(3) describe and interpret genome-wide association studies and (exome) sequencing studies
(4) describe gene-set analysis and explain its rationale
(5) explain the importance of iPSC studies for psychiatric genetics
(6) summarize, critically analyze, and reflect on research papers in the field of psychiatric genetics
(7) pitch a research proposal in the field of psychiatric genetics

Type of assessment
Course Content
Malfunctioning in everyday life may be due to a psychiatric disorder; the most common disorders being anxiety and mood disorders. Considerable overlap exists with comorbid somatic and neurological conditions and treatment may take many different forms. Depending upon the level of cooperativeness and commitment, psychological skills, pharmacotherapy, somatic or neurobiological treatments may be offered to relieve symptoms. During this course you get to learn more about the complex interactions between neuroscience and psychiatric disorders in adulthood and the choices presented in choosing a treatment.
In week 1, we will focus on diagnostics of psychiatric disorders. Current genetic and imaging research is presented and discussed, with special attention to risk factors for psychiatric disorders.
In week 2, we will discuss somatic comorbidities in psychiatric disorders and focus on prevention. Examples: cardiovascular and neuroendocrine comorbidities, drug and alcohol dependency, and psychiatric comorbidity. Focus of discussion: Ethical implications of treatment choice.
In week 3, we will discuss motivational techniques. Practical skills will be acquired under the guidance of experienced psychologists. Use of E-health treatment, apps and internet, will be practiced. Novel treatment options will be discussed, such as transmagnetic stimulation, deep brain stimulation, and neuro-immunological treatments.
In week 4, evaluation of current available treatment is the central theme. Results of relevant meta-analyses will be presented and we will discuss their implications for the individual patient. Currently available (evidence based) treatment will be presented, leading to a discussion focusing on neuroscientific research aimed at improving outcome.
Course objective
The student will learn to
(1) Describe and explain current developments in research in the field of psychiatry, its use and shortcomings in everyday clinical practice.
(2) Describe and interpret factors that determine treatment outcome
(3) Outline and discuss complex dilemmas in the field of psychiatry

Inhoud vak
Course Content
Globally, millions of people suffer from debilitating psychiatric disorders. At present, these disorders are incurable, which necessitates the development of advanced prevention strategies, diagnostic tools and treatments. In this module, you will gain insight in the latest developments in psychiatry research, as well an overview of the novel research methods (ranging from genome-wide association studies to neuro-imaging in patients). Topics: child- and adolescent psychiatry, forensic psychiatry, schizophrenia, autism, depression, and comorbid somatic and neurological conditions.
Course objective
You will gain insight in the latest developments in psychiatry research, as well an overview of the novel research methods (ranging from genome-wide association studies to neuro-imaging in patients). In addition, you will learn how to analyze and evaluate research papers, how to write an opinion article, and discuss ethical dilemmas in the field of psychiatry.
psychiatry. Collectively, these courses will serve as an excellent preparation for the Bachelor’s thesis and the scientific internship (M1 or M3).

Hot topics in Psychiatry – Course 1: Crisis and Forensic Psychiatry

Course Content

What if all goes wrong and your patient becomes so seriously ill that he or she gets into a crisis situation or gets delirious? When a patient, despite all previous efforts to help him/her, becomes suicidal? When problems become that severe that a patient gets him- or herself into serious trouble? Or when he or she commits a criminal act?

This course forms the first course within the minor module Hot Topics in Psychiatry. During this course you get to learn about the most complex fields of psychiatry: crisis and forensic psychiatry in childhood and adolescence. As the course will be set up from a neurodevelopmental perspective, the course starts form a child- and adolescent perspective, with links to adult psychiatry.

In week 1, we will start with the relation between serious somatic illness and psychiatry and vice versa, and consultative psychiatry, in week 2 the suicidal patient is central, including severe automutilation and autointoxication, in week 3 we focus on the threatened child that grows up in an aggressive and unsafe environment, in week 4 the delinquent is central, the patient that has severe behavioral problems like aggression, impulsivity and drug abuse, with focus on the role of psychiatric problems in the development of (persistent) delinquent behavior.

A patient or clinical case is always the starting point, and from that we will get into questions like: what neurodevelopmental mechanisms have led to this kind of complex problems? What environmental, psychological and neurobiological mechanisms are involved? What do we know from research about this type of patients? What further research is needed, and how could that be designed? What (evidence based) treatments are available?

Each week will consist of interactive lectures, work groups and an excursion (f.i. to a Closed psychiatric ward, Closed youth care institution, Juvenile justice institution)

Course objective

The student will learn to
(1) Describe and explain complex psychiatric problems in crisis and forensic psychiatry
(2) Describe and interpret (neurodevelopmental) risk factors for psychiatric problems in crisis and forensic psychiatry.
(3) Summarize, critically analyze and reflect on research papers in the field of crisis and forensic psychiatry.

Type of assessment
Short written assignments (mid-term) and written exam consisting of open-ended questions (final exam)

Hot topics in Psychiatry – Course 2: Psychiatric genetics

Course Content
This course provides a comprehensive overview of the current state-of-the-art in the field of psychiatric genetics. It covers basic concepts like heritability and the difference between Mendelian and (genetically) complex disorders. We will extensively discuss recent results from genome-wide association and sequencing studies in psychiatric genetics. Finally, we will discuss the importance of state-of-the-art techniques like pluripotent stem cell cultures (iPSC) for understanding complex disorders.

Course objective

The student will learn to
(1) explain the concept of (missing) heritability and interpret heritability estimates of psychiatric disorders
(2) explain the difference between Mendelian and (genetically) complex disorders and its implication for psychiatric genetics
(3) describe and interpret genome-wide association studies and (exome) sequencing studies
(4) describe gene-set analysis and explain its rationale
(5) explain the importance of iPSC studies for psychiatric genetics
(6) summarize, critically analyze, and reflect on research papers in the field of psychiatric genetics
(7) pitch a research proposal in the field of psychiatric genetics

Type of assessment
Open-ended and closed question exams and oral presentation (in groups).

Hot topics in Psychiatry – Course 3: Breaking bad, or getting better?

Course Content
Malfunctioning in everyday life may be due to a psychiatric disorder; the most common disorders being anxiety and mood disorders. Considerable overlap exists with comorbid somatic and neurological conditions and treatment may take many different forms. Depending upon the level of cooperativeness and commitment, psychological skills, pharmacotherapy, somatic or neurobiological treatments may be offered to relief symptoms. During this course you get to learn more about the complex interactions between neuroscience and psychiatric disorders in adulthood and the choices presented in choosing a treatment.

In week 1, we will focus on diagnostics of psychiatric disorders. Current genetic and imaging research is presented and discussed, with special attention to risk factors for psychiatric disorders.

In week 2, we will discuss somatic comorbidities in psychiatric disorders and focus on prevention. Examples: cardiovascular and neuroendocrine comorbidities, drug and alcohol dependency, and psychiatric comorbidity. Focus of discussion: Ethical implications of treatment choice.

In week 3, we will discuss motivational techniques. Practical skills will be acquired under the guidance of experienced psychologists. Use of E-health treatment, apps and internet, will be practiced. Novel treatment options will be discussed, such as transmagnetic stimulation, deep brain stimulation, and neuro-immunological treatments.

In week 4, evaluation of current available treatment is the central theme. Results of relevant meta-analyses will be presented and we will
discuss their implications for the individual patient. Currently available (evidence based) treatment will be presented, leading to a discussion focusing on neuroscientific research aimed at improving outcome.

Course objective
The student will learn to
(1) Describe and explain current developments in research in the field of psychiatry, its use and shortcomings in everyday clinical practice.
(2) Describe and interpret factors that determine treatment outcome
(3) Outline and discuss complex ethical dilemmas in the field of psychiatry

Type of assessment
Written assignment, debate participation, written exam

Toetsvorm
Written assignments, debate, written exams, oral presentation.

Literatuur
An overview of the study material is placed on CANVAS.

Aanbevolen voorkennis
Level 200 knowledge of pathological mechanisms and symptoms of common psychiatric disorders.

Doelgroep
Final year Bachelor's students in Medicine, with an active interest in psychiatry.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure
Before the start of the semester students will be invited to indicate their preferred minor track, however the Institute of Education and Training (IET) will make a final selection based on both student preferences and availability in the different tracks. Once you have been selected for a track, the administration of IET will make sure you're registered for all educational activities such as study groups, courses and exams. Important: Please mind that in case you won't pass the exam you'll not be automatically registered for a re-examination. In order to sign up for a retis, you'll need to apply in time (which is two weeks before the re-examination) for the exam through the form Re-take exam Bachelor of Medicine.

Immunology-Infection-Cancer Connected

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Inhoud vak
This module combines an in depth education in immunology, ranging from research defining basic molecular principles to translational testing and clinical application, combined with two important related research fields, i.e. oncology and infection biology. This module is specifically interesting for future oncologists, rheumatologists, neurologists, gastroenterologists, pathologists, medical microbiologists and internists.

The minor module "Immunology-Infection-Cancer connected" includes 3 courses:
1: Challenges in Clinical Immunology
2: Infectious diseases: ‘Understanding pathogens and the strategies to eradicate them’
3: Cancer: ‘From basic science to clinical breakthroughs’

Course 1: Challenges in Clinical Immunology
Coordinator: prof. dr. Y. van Kooyk, prof. dr. R. Mebius

The course clinical Immunology is aimed to discuss the various immune-related processes that play a crucial role in almost every disease. It is often the balance of within the immune system that determines the outcome of disease, ranging from tissue destruction to complete cure. To illustrate this point we will touch upon immunological aspects that are out of balance and result in auto-immune reaction in diseases such as inflammatory bowel disease (IBD), celiac disease (CD), multiple sclerosis (MS) and rheumatoid arthritis (RA).

On the other hand, lack of immunity due to specific molecular deficiencies can result in cancer. Also insight in the latest achievements of cancer treatment by immune therapy will be highlighted in which new technologies and ways to specifically activate the immune system to specific cancers will be discussed.

The course will start with a clinical introduction into the features of the disease by a practicing clinician at the VUmc, who will illustrate clinical symptoms in patients. Thereafter, lectures, given by in-house (VUmc) and other national medical center experts, will be dedicated to the immunological mechanisms that play a role during these complex diseases. These lectures highlight state of the art research using molecular immunological tools, as well as novel strategies such as genomics- profiling of the disease, the use of animal models that mimic disease, as well as vaccine development and treatment methodology of the diseases.

This course includes lectures, team-based-learning sessions, workgroup discussions and presentations, literature review, site-visit to READE for patient interview and defining research questions.

Course 2 Infectious diseases: "Understanding pathogens and the strategies to eradicate them"
Coordinators: dr. A.M. van der Sar and prof. dr. W. Bitter

The course Infectious Diseases will discuss the interaction of microbial
pathogens with their host and how these infections can be treated. We will focus on chronic inflammatory diseases and the (putative) link with microorganisms, such as tuberculosis and AIDS and explain how pathogens are able to mount a chronic infection in a host with a well-developed immune system. We will discuss the use of antimicrobials (with an emphasis on antibiotics and anti-viral agents) in the clinic and the emergence and spread of antibiotic resistance among human pathogens. Subsequently, we will look at the isolation of new antibiotics. What is a good drug target? What is a good compound? And how do you set up screens to find compounds blocking these new targets? In the last part you will learn what factors are crucial to make a successful introduction of new compounds in the clinic.

This course will give a good insight in the ongoing battle between a pathogen and its host.

A hands-on practicum on susceptibility testing will teach you interpretative reading of antibiograms.

This course includes lectures, workgroup discussions with literature review and presentations.

Course 3: Cancer: "From basic science to clinical breakthroughs"

Coordinators: prof. dr. A. van de Loosdrecht and dr. T. Mutis

This course is aimed at offering in depth education in oncology, ranging from basic molecular biology to clinical bedside research. By the discussion of several major tumor types, recent developments in oncology research will be reviewed. Translation and application of new scientific results into the clinic is a major theme during this course. Virus-induced oncogenesis and immunological processes accompanying tumor development as well as opportunities to use the immune system to fight cancer will also be topic of this course. As a physician, top perform evidence-based medicine, it will be important to be able to critically analyze the scientific literature. The central question within this course is: how does biomedical knowledge support the clinic?

The course focus on three major areas:

1) the development of early diagnostics to detect cancer in the earliest phases, to increase the likelihood of curing a patient;

2) the development of personalized medicine strategies to select the optimal treatment for an individual patient, based on the characteristic biology of the disease and;

3) recent advances in tumor immunology as the induction of immunity (immune therapy) can lead to cure of cancer.

These topics will be discussed on the basis of several major tumor types: breast cancer, colon cancer, hematological malignancies, HPV-induced tumors (cervix and head & neck cancer) and lung cancer.

This course exists of plenary lectures, patient interviews, workgroups, an excursion and a visit to the outpatient clinic.

The three courses within this module will primarily exist of plenary lectures of key clinical specialist and researchers in the field of immunology, infection biology and cancer. Patients interviews and a visits to the outpatient clinic are organized. Team-based learning (TBL) sessions are organized and in depth critical searching, practical skills, as well as reading, interpretation and oral presentations of scientific literature by the students will be facilitated and is required to prepare scientific debating and research-related presentations.

Course objectives

Describe the learning objectives of the module.
Course 1: Challenges in Clinical Immunology
• The student acquire insight in both clinical parameters as well as basic scientific principles playing a role in these diseases.
• The student will learn to understand the mechanism by which the immune system is de-regulated within diseases, such as in MS, IBD, Celiac disease, RA, Cancer and Immunodeficiencies, the limitations of treatment and how one could modify immune response to the benefit of the patient.
• The student will apply the acquired knowledge of scientific literature and scientific hypotheses of each of the disease topics described above by presenting it to their fellow students.
• The student will identify the current lack of knowledge of disease mechanisms and limitations of treatment.
• Based on this knowledge, to formulate a research proposal and workplan to fill this gap.
• The student will formulate a research proposal and a workplan to fill this gap, using the acquired knowledge.

Course 2: Infectious Diseases
• The student will acquire knowledge of host-microbial interactions.
• The student will learn about the methods of drug susceptibility testing, including tests used for detecting specific resistance mechanisms.
• The student understands the problems associated with antibiotic/antimicrobial resistance.
• The student has knowledge on how new antibiotics are identified, developed and the roadblocks encountered for bringing new antimicrobials to the clinic.
• The student is familiar with the problems involved in developing and using anti-viral agents for HIV.
• In addition, the students will get an introduction into critical reading of scientific articles dealing with the differences in antibiotic development from the 1940 till 2015 and will present their findings to each other.

Course 3: Cancer
• The students will learn about all spectrums of oncology.
• The student is able to reproduce basic principles of (virus-induced) tumor development; i.e. the genetic, molecular, and cellular process that are out of balance in cancer.
• The student has knowledge on the characteristics, potentials and key elements of research in oncology with emphasis on tumor immunology and immunotherapy.
• The student will learn to link basic scientific research with the clinical practice and vice versa.
• In addition, the students will get an introduction into critical appraisal of scientific articles.

Toetsvorm
Describe the type of exams and/or assignments.
Course 1: 50 MC-questions (that constitutes 65% of final mark) and research-related presentations by the students (that constitutes 35% of final mark)

Course 2: includes one exam of open & multiple choice questions), together they form the exam that constitutes 80% of final mark. A literature assignment, that constitutes 20% of final mark.

Course 3: includes an assignment and a CAT (that constitutes 70% of final mark) and oral presentations (that constitutes 30% of final mark).
Each course includes two examinations after 2 and 4 weeks, which can include a CAT, multiple choice questions, and/or open questions.

Literatuur
An overview of the study material is placed on CANVAS.

Doelgroep
Minor students of VUmc School of Medical Sciences.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure
Before the start of the semester students will be invited to indicate their preferred minor track, however the Institute of Education and Training (IET) will make a final selection based on both student preferences and availability in the different tracks. Once you have been selected for a track, the administration of IET will make sure you’re registered for all educational activities such as study groups, courses and exams.
Important: Please mind that in case you won’t pass the exam you’ll not be automatically registered for a re-examination. In order to sign up for a resit, you’ll need to apply in time (which is two weeks before the re-examination) for the exam through the form Re-take exam Bachelor of Medicine.

Internal Medicine

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Inhoud vak
Course content
Internal medicine is the medical specialty dealing with the prevention, diagnosis, and treatment of adult diseases. Internal medicine is a broad discipline, covering various fields such as Acute medicine, Cardiovascular Aging and Geriatrics, Clinical pharmacology and therapeutics, Diabetes & Cardiovascular Disease, Transgender medicine and Endocrinology. The department of Internal medicine of the VU University medical center is a leading center with expertise in these fields of academic research and (complex & multidisciplinary) clinical care. The discipline of Internal Medicine intersects with many other fields in medicine and this is also reflected in the minor courses of
the Module Research in Internal Medicine. The Module Research in Internal medicine will give broadening, deepening and stimulates your critical appraisal of relevant issues in the research field of Internal medicine. The department of internal medicine collaborates and is part of a large number of research institutes, such as ICAR-VU, Cancer Centre, EMGO and LEARN.

Course objective
The primary learning objective of the course is to stimulate knowledge and skills related to research in the broad discipline of internal medicine.

After the module the student can:
- critically appraise scientific literature and research designs (e.g. with regard to internal medicine and drug research)
- give a scientific (poster) presentation and write scientifically (e.g. mini paper, research proposal)
- debate on the roles of the pharmaceutical industry, the government and healthcare professionals in (drug) research in internal medicine

A further specification of the objectives of the six courses in the module research in internal medicine can be found on CANVAS.

Toetsvorm
Type of assessment
The courses will be assessed by a wide variety of exams and assignments, such as scientific (mini)papers and presentations, scientific poster presentations, scientific literature assignments, real life assignments (e.g. with CBG/LAREB), group assignments (e.g. debate), written exams (open ended questions/MC), simulation based scenarios, performing of a debriefing and scenario based training assignments. More details will be given at the start of de minor-module.

Literatuur
Course reading
An overview of the study material is placed on CANVAS.

Aanbevolen voorkennis
Recommended background knowledge
General medical knowledge and interest in research in the broad field of internal medicine

Doelgroep
Target audience
Minor students of VUmc School of Medical Sciences.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure
Before the start of the semester students will be invited to indicate their preferred minor track, however the Institute of Education and
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Overige informatie
Remarks
Participants can choose 3 out of the following 6 courses within the module. In this way students create their own ‘personal’ track. We will try to organize the track in such a way that as many first choices can be executed.

Choice of 3 out of the following 6 courses within the module:
- Acute internal medicine
- Cardiovascular Aging and Geriatrics
- Clinical pharmacology and therapeutics
- Diabetes & Cardiovascular Disease
- Transgender medicine: multidisciplinary patient care and research
- Endocrinology: from science to bedside and the other way around

Bonus activity:
In addition to all the research related activities in the module students are given the opportunity to work (a few hours) in real practice in one of the Student Run Clinic’s (SRC), with real responsibility for patient care! Theme’s addressed in the SRC are for example hypothyroidism in pregnant women, transgender care, pharmacovigilance and polypharmacy.

Minor Literature Essay

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Inhoud vak
The Minor Literature Essay is a short systematic literature review or research report (for research minor students only). During this course you will design and perform your own literature study on a specific (bio)medical subject of your own choice, and report the results in a written scientific report in English of about 3000-5000 words.

In the first week of the course, you will design your literature study and write a proposal for your bachelorthesis. In week 2-4 of the course, you will perform your literature study and write a scientific report on the results; the actual bachelorthesis.
Supervision will consist of guidance by an individual supervisor and working groups.

Before the start of the course (preferably during the minor) you decide on a subject and find and contact an individual thesis supervisor (this is your own responsibility; for criteria supervisors see CANVAS). The individual thesis supervisor will guide you during the course regarding the specific subject of your choice. You will have to plan an appointment with your personal supervisor once a week during the course.

In addition, you will be able to attend 4 working group meetings focusing on scientific writing. The aims of these working group meetings are:

- To learn how to write (writing skills; knowledge)
- To offer structure in the writing process (intermediate deadlines by preparing assignments for each group)
- A peer-review process of each others work (assignments will be discussed in small groups)
- Presenting (short presentations)

Working groups consist of 6-12 students, who collaborate within the course. The four working group meetings will focus on the following distinct subjects:

Week 1 - Research objective and search strategy
Week 2 - Methods and results
Week 3 - Title, introduction, first draft abstract and outline
Week 4 - Discussion and conclusion

Note: research minor students only will write a scientific report on their own scientific study instead of a literature study. They will be supervised by the supervisor of their research minor project.

Course objective
The student is able to design and perform a literature review on a specific (bio)medical subject.
The student can write a scientific report of the results in correct scientific English.
The student has shown to have sufficient insight in the scientific literature and reporting thereof to be able to start the scientific internship in the master programme.

Note: Research minor students only will write a scientific report on the topic of their own research minor project.

Toetsvorm
Minor Literature Essay: written assignment consisting of a scientific report on a (bio)medical subject of 3000-5000 words in English.

Literatuur
An overview of the study material is placed on Canvas.

Doelgroep
External (international) minor students.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of approved supervisors, the required articles and assignments.
The Canvas course will also be used to post announcements relevant to the course. You will automatically have access to the Canvas course.

Intekenprocedure
All students are automatically enrolled for the working groups. If you have previously written a bachelorthesis or comparable assignment, or if you are abroad for your minor during the bachelorthesis course, and do not wish to attend the working groups, you are requested to send an e-mail to bachelor.info@vumc.nl within two weeks before the starting date.

Overige informatie
Vice-cursuscoördinator: Dr. L.M.C. Nauta-Jansen

Peri-operative Care and Anatomy

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Inhoud vak
Course Content
The track "multidisciplinary perioperative patient management and integrated surgical anatomy" offers a comprehensive program for students with interest in perioperative care and management of surgical emergencies.

Course objective
Overall aims of the track
I: To make students aware of the multidisciplinary approach of perioperative patient care and the complexity and the interactions of physiological reactions on surgical trauma.
II: To deepen the integrated clinical and anatomical knowledge of the student by means of a combination of relevant surgical anatomical landmarks and dissection of human anatomy in the dissection room and the relation of anatomy as seen in various imaging modalities.

Toetsvorm
Type of assessment
exam with multiple choice
Written research proposal
Group assignments with 5 students
Station exam

Literatuur
Course reading
An overview of the study material is placed on CANVAS.
Aanbevolen voorkennis
Recommended background knowledge
Knowledge of basic medical science comparable to the endlevel of bachelor 2 is mandatory to participate in this track.

Doelgroep
Course audience
Minor students of VUmc School of Medical Sciences.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure
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Personalized Medicine

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Inhoud vak
Medical treatments are usually based on the principle of ‘one size fits all’. However, patients are different in their genetic DNA profile, immune system, metabolism and many other characteristics. Thus for your individual patient, the treatment should be optimized by accounting for these personal characteristics. For example, in oncology you aim to target affected cells, without harming normal cells. To visualize the pathway of the medicine, it is connected to a radioactive nucleus which can be seen at a nuclear medicine scan. You can then verify if the medicine arrives at the target tissue, and not in healthy tissues. Also, you can assess if the desired metabolic effect is reached. Is your patient a responder or not? This is ‘Personalized Medicine’.
This minor will give you insight in Personalized Medicine.
The 1st course, Medical Imaging, will learn you about advanced imaging techniques such as Nuclear Medicine and MRI. This novel imaging is used to assess if your patient is responding to therapy. This knowledge of imaging will be helpful for you as a doctor.
The 2nd course, Advanced Diagnostics, will teach you the latest molecular techniques (e.g. DNA- and RNA-profiling, prenatal testing) for ultra-sensitive testing, and for selecting the best therapy.
The 3rd course, Nanomedicine, is a new field of medicine in which small particles of nanosize (nano = 10^-9 meter) are used for targeted drug delivery. These nanoparticles are too large to pass through the healthy vessel wall, but in diseased regions (inflammation, tumor) the endothelial wall is more permeable, so the nanoparticles can leak through and reach affected tissues. Targeting is also possible by attaching antibodies to the nanoparticle. Thus a maximal effect is reached in the target tissue, while toxic side effects are avoided.

Course objective
Course 1: Medical Imaging
After this course the student can
1. Explain radiologic indications in neurology, oncology, and cardio-pulmonary diseases;
2. Justify the right imaging modality for these indications;
3. Apply the physics of Ultrasound, Röntgen, CT, MRI, SPECT and PET;
4. Calculate tissue properties from CT, MRI (T1, T2, perfusion, diffusion, function), SPECT/PET (metabolism);
5. Explain applications of image-guided surgery, image-guided radiotherapy, image-guided medication;
6. Calculate the amount of ionizing radiation the patient is exposed to.

Course 2: Advanced Diagnostics
After this course the student can
1. Explain the relevant indications for laboratory diagnostics;
2. Recognize and explain the pitfalls of various laboratory assays;
3. Describe how the discovery till the implementation of new biomarkers works;
4. Explain different methods of measurement and choose the optimal method for diagnosis or research.

Course 3: Nanomedicine
After this course the student can
1. Describe the field of nanomedicine;
2. Explain basic applications of nanotechnology and nanoscopy in medical practice;
3. Give specific examples of nanomedicine applications in the VUmc (e.g. diabetology, oncology);
4. Explain nanomedicine opportunities and challenges in the near future.

Toetsvorm
Individual presentation
Individual written exam

Literatuur
An overview of the study material is placed on CANVAS.

Doelgroep
Minor students of VUmc School of Medical Sciences.

Uitleg in Blackboard/Canvas
CANVAS
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Intekenprocedure
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Research Minor: Science in Medicine

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Inhoud vak
Overall content of the research minor
Within clinicians and medical students there is a growing awareness that medical research is the key to good clinical practice. Not only knowledge, but also practical experience is important. Because of this growing awareness, the research minor Science in Medicine is developed. During this research minor, the students learn and discuss the theoretical background of medical research, which also includes the pitfalls and limitations of science in medicine. Besides the theory, during the research minor, the students also perform a study in one of the research institutes of the VU medical center. The end product of this study can be used for the Bachelor thesis.

Science in Medicine: the set-up (Course 1)
In the first week of the first course of the research minor Science in Medicine you will learn more about how to set-up different types of studies. You will learn how to write a research proposal; which pitfalls you will encounter when performing a cohort or case-control study as well as a randomized controlled trial (RCT). In the second week, you will learn more on performing research with
patients and all issues regarded to performing patient related studies: medical ethics committees, which in- and exclusion criteria are necessary for your study, ethics concerning patients data as well as how to perform research in vulnerable groups such as children, disabled, prisoners or patients with dementia. You will also learn how to calculate a sample size. Besides that, you will learn how to select measurement instruments, how to validate them and apply them in your study.

In the third week, we will go in-depth in pharmaceutical studies, how to judge the quality of published articles, and how to calculate a budget for a study. In the second part of this week we will pay intensive attention to performing systematic reviews and meta-analyses. In the last week, an overview of the course will be given and opportunities to ask questions in preparation of the CAT.

Besides the teaching and practical hours, you will be working on your research for 2.5 days at the department where your research takes place.

Science in medicine: the analysis (Course 2)
In the second course of the research minor science in medicine you will learn more about the statistical analysis of research data. First of all, we will built further on the knowledge gained in MWO2. Besides that, you will learn how to analyse data from a randomised controlled trial, especially you will learn how to deal with the problem of regression to the mean, how to deal with data from repeated measurements and how to deal with missing data. In the last lecture you will learn about the pitfalls and how to deal with them. In the practical sessions you will learn how to analyse your data within SPSS and during the course you will work on your own research project.

Science in medicine: the interpretation (Course 3)
In the third course of the research minor science in medicine the interpretation of statistical results is the main topic. This course can be seen as a follow-up of both previous courses within the Minor Science in Medicine. Topics that will be discussed are for example the differences between statistical significance and clinical relevance. Questions that will be discussed are “are all statistical results also clinically relevant?”. Furthermore, you will learn how to build a prediction model based on empirical data in different ways. Besides that, the differences between regression models that assess confounding or mediation and prediction or associations will be discussed. Although some statistical models may look the same because both can contain the same variables, their aim in terms of research question and interpretation of results differ as well as their methodological approach. We will also take a look at the interpretation of models that include interaction terms among different type of variables as continuous and categorical variables, unadjusted and adjusted for other variables. This will be done for linear, logistic and Cox regression models but also for more advanced longitudinal or multilevel models. The translation of research findings into clinical practice, as for example the applicability of prediction models in daily practice, and good and bad examples of published studies in terms of the correct interpretation of study findings will also discussed. In the practical sessions you will learn how to analyse and interpret different statistical models within SPSS and during the course you will work on your own research project.

Course objective
General
1. Students can write a research proposal
2. Students can analyse and interpret their own research data.
3. Students can make a proper conclusion based on the results.
4. Students can present their research in an appropriate manner.
5. Students can critically reflect on the research they performed.

Course 1
1. Students can recognize and describe a research problem based on the literature.
2. Students can define a research question based on a real life problem.
3. Students can select and motivate the correct research design given the research question.
4. Students can evaluate the quality of measurement instruments and select the right instrument given their research question and design of the study.
5. Students can recognize pitfalls in the conduction of scientific research and explain/show how to deal with these pitfalls.

Course 2
1. Students can select and motivate the correct statistical methods that need to be used to analyse the data based on the research question and design.
2. Students can distinguish the differences between prediction and association.
3. Students can interpret the results of advanced statistical techniques.
4. Students can recognize different missing data mechanisms, are able to motivate what consequences of these missing data are for research results and are able to propose solutions for the missing data problem.
5. Students can recognize pitfalls in the conduction of statistical analyses and explain/show how to deal with these pitfalls.

Course 3
1. Students can formulate an answer to a research question based on the results of statistical analyses.
2. Students can present the results of scientific research to peers in an appropriate way.
3. Students can evaluate the quality of prediction rules and are able to select the prediction rule that can best be used in daily practice.
4. Students can discuss the results of scientific research in light of the literature and daily practice.
5. Students can recognize pitfalls in the interpretation and presentation of results of scientific research and explain/show how to deal with these pitfalls.

Toetsvorm
Course 1
• Exam with open ended questions
• Research proposal
First there will be an open book, open question exam.
Secondly, you will have to hand in your research proposal which has to be evaluated as sufficient.

Course 2
• Exam with open ended questions
• SPSS exam
There will be an open book, open question exam and a SPSS computer test. Both count for 50% of the final mark and compensation is not possible, which means that both exams must be marked with 6 or higher.

Course 3
• Exam with open ended questions
• Presentation on a symposium
There will be an open book, open question exam which will count for 80%. Secondly, you will present your research on a symposium. The presentation will count for 20% of the final mark Compensation is not possible, which means that both exams must be marked with a 6 or higher.

Literatuur
An overview of the study material is placed on CANVAS.

Aanbevolen voorkennis
MWO 2

Doelgroep
Minor students of VUmc School of Medical Sciences.

Uitleg in Blackboard/Canvas
CANVAS
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Intekenprocedure
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The Moving Body-in Health and Disease

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<td>Coördinator</td>
<td>prof. dr. V. de Groot</td>
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<td>Lesmethode(n)</td>
<td>Hoorcollege, Practicum, Studiegroep</td>
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Inhoud vak
Musculoskeletal disorders and neurological movement disorders are among the leading chronic diseases in the Netherlands. These disorders lead to (a sometimes severe) loss of quality of life and significant social costs due to medical consumption and disability. In the VU University Medical Center more than 6000 patients are treated annually for these disorders. These include diseases like congenital musculoskeletal disorders, (sport) trauma, osteoarthritis, rheumatic diseases, congenital and acquired neurological disorders such as cerebral palsy, stroke, Multiple Sclerosis and Parkinson’s disease. In the domain of Public Health, several physical activity campaigns are aimed at implementing a healthy life style, reducing risk factors, and preventing of, among others, musculoskeletal disorders.

The courses of the minor are: 1) The moving body in health, coordinated by dr Evert Verhagen, Dept Public and Occupational Health, VUmc; 2) The moving body in adults, coordinated by prof dr Vincent de Groot, Dept Rehabilitation Medicine VUmc, 3) The moving body in children, coordinated by dr Annemieke Buizer, Dept Rehabilitation Medicine VUmc. This 12-week intensive minor program allows students to get acquainted with, and acquire in-depth knowledge on the medical disciplines Sports Medicine (course 1), (Pediatric) Traumatology, Orthopaedic Surgery, Reumatology and (Pediatric) Rehabilitation Medicine (courses 2 and 3), with a direct link to the scientific basis and scientific research about the moving body in health and disease. The prevention, etiology, diagnostics, and surgical and non-surgical treatment of movement disorders is the common thread running through the three courses. In addition to a clinical approach of movement-related problems, the contemporary evidence with regard to cutting edge treatment methods (e.g. tissue engineering, 3D-printing), epidemiology, risk factors and the scientific background of a particular treatment method are explicitly addressed. The courses will consist of interactive lectures, self-study, study assignments, and practicals. The interactive lectures are given by clinical physicians, surgeons, research experts from the AMC-VUmc Research Institutes Amsterdam Movement Sciences and Amsterdam Public Health, as well as by external lecturers. At the end of each week, a minisymposium will be organized, with students presenting the scientific results of the study assignments.

Course objective
This 12-week intensive minor program allows students to get acquainted with, and acquire in-depth knowledge on the medical disciplines Sports Medicine (course 1), (Pediatric) Traumatology, Orthopaedic Surgery, Reumatology and (Pediatric) Rehabilitation Medicine (courses 2 and 3), with a direct link to the scientific basics and scientific research about the moving body in health and disease. After the minor, students can explain the (translational) links between clinical practice on the one hand and on the other hand the science to acquire knowledge on specific topics of the moving body in health and disease. Moreover, students understand the approaches of both clinical epidemiological research and translational biomedical research within the realm of prevention, etiology, diagnostics, and surgical and non-surgical treatment of musculoskeletal disorders and neurological movement disorders.

Learning Objectives Course 1 The moving body in health
Course Coordinator: dr Evert Verhagen, Dept Public and Occupational
After this course the student can:
- describe the epidemiology, etiology, rehabilitation and prevention of sports related injuries
- describe the role of exercise in the rehabilitation of chronic and non-communicable disease;
- apply diagnostic, prognostic, rehabilitative principles of common sports related injuries;
- discuss the value of contemporary rehabilitation and preventive approaches in sports medicine;
- collaborate/work with physicians and therapists care professions to perform the multidisciplinary role of the sports medical team in a clinical and sports medical setting.

Learning Objectives Course 2 The moving body in adults
Course Coordinator: prof dr Vincent de Groot, Dept Rehabilitation Medicine VUmc

After this course the student can:
- apply the International Classification of Functioning to describe functioning of patients;
- explain the different research methodologies that are used in rehabilitation research, and choose (including justification) the appropriate research methodology and design given a specific rehabilitation related research question;
- perform a physical examination of the joint range of motion of the lower and upper limbs and spine;
- interpret and explain the results of clinical movement analysis in relation with information of the patients history and physical examination.

Learning Objectives Course 3 The moving body in children
Course Coordinator: dr Annemieke Buizer, Dept Rehabilitation Medicine VUmc

After this course the student can:
- describe the main medical conditions of pediatric orthopedic surgery and pediatric rehabilitation medicine;
- describe the indications, techniques, complications and results of various surgical and non-surgical procedures used in the treatment disabled children;
- discuss current concepts in the management of pediatric conditions of the moving body;
- explain and judge the anatomical, physiological and biomechanical age-related differences in sports, orthopaedics and rehabilitation medicine;
- perform a physical examination and clinical gait analysis, and understands its role in clinical decision making.

Toetsvorm
Type of assessment for each course is the same: a mid-term exam of a study assignment, and a final CAT with open questions related to a key scientific article or a clinical movement analysis. Furthermore, the presentation of each individual student at the minisymposium will be part of the final grade.
Retake of the Minor: Clinical Gait Analysis and open questions related to a scientific article.
Aanbevolen voorkennis
All topics of Medicine Bachelor years 1 and 2 that could be related to this minor are assumed to be known by the student.

Course reading
An overview of the study material is placed on CANVAS

Target audience
Minor students of VUmc School of Medical Sciences.

CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and study assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Register
All students who enrolled into the International Minor in Medical Sciences are registered by the IOO for educational activities for this course and exams.

Intekenprocedure
Before the start of the semester students will be invited to indicate their preferred minor track, however the Institute of Education and Training (IET) will make a final selection based on both student preferences and availability in the different tracks. Once you have been selected for a track, the administration of IET will make sure you're registered for all educational activities such as study groups, courses and exams. Important: Please mind that in case you won't pass the exam you'll not be automatically registered for a re-examination. In order to sign up for a resit, you'll need to apply in time (which is two weeks before the re-examination) for the exam through the form Re-take exam Bachelor of Medicine.

Overige informatie
During the courses some specific study books will be highly recommended.

Translational Sciences in Medicine

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Inhoud vak
The Minor in Medicine starts with a general course entitled ‘Translational Sciences in Medicine’. The general course is designed to increase the skills of medical students that are required to integrate
and execute scientific research in the education as medical doctor. During the course, students get acquainted with distinct stakeholders that play a central role in the scientific community. The translational aspect of the different research will be emphasized by the presentation of clinical and preclinical research examples. Additionally, students will be guided in the different steps that are required to design a scientific research project in view of study design, research ethics, and statistical analysis.

The general course is based on three different themes that are relevant in preclinical and clinical scientific research:

1) Essential scientific skills
During the first week we focus on basic skills required for scientific research, including critical reading and writing of an article, the design of a study protocol, the formulation of a study objective and hypothesis and basic statistical techniques. The week assignment focuses on critical reading of an article.

2) Translational research & being a scientist
In the second week the student gains insight in several aspects of translational research, including the regulations for experimental research in animals. Moreover, we will focus on general aspects of scientific research, including entrepreneurship and research integrity. The week assignment focuses on writing of an animal experimentation study protocol.

3) Clinical research & Scientific Career Planning
The third week focuses on aspects of clinical research. The student will gain insight in the pillars of the Dutch Human Subjects research act (Wet Medisch-Wetenschappelijk Onderzoek met mensen; WMO), including involvement of study subjects and the risks of studies with pharmaceutical or technology interventions. Moreover, the student gains insight in aspects related to a clinical and scientific career. During the week assignment, students have to judge a clinical study from the perspective of the Human Subjects committee.

Course objective
During the course we aim to strengthen the academic background of medical students in order to optimize their knowledge and skills required for a position in the scientific context of modern health care.

Toetsvorm
The course will end with a general exam (CAT) consisting of open and closed questions. The final mark is based on the final exam and the assignments. National and international PhD students and post-doctoral fellows will chair the study groups and coach and supervise the medical students during the fulfillment of their assignments.

Literatuur
An overview of the study material is placed on CANVAS.

Aanbevolen voorkennis
The background knowledge that is recommended depends on the learning track that is chosen by the student.
Doelgroep
Minor students of VUmc School of Medical Sciences.

Uitleg in Blackboard/Canvas
CANVAS
This course is supported by a corresponding CANVAS course, which contains all of the required information of this course including overview of the required articles and assignments. The CANVAS course will also be used to post announcements relevant to the course. You will automatically have access to the CANVAS course.

Intekenprocedure
All students who enrolled into the International Minor in Medical Sciences are registered by the IOO for educational activities for this course and exams. Please mind that in case you won’t pass the exam you’ll not be automatically registered for a re-examination. In order to sign up for a rest, you’ll need to apply in time (which is two weeks before the re-examination) for the exam through the form Re-take exam Bachelor of Medicine.

Overige informatie
Coordinatoren: Prof.dr. H.E. de Vries en Prof.dr. C. Boer