



Human Movement Sciences: Sport, Exercise and Health (MSc)

Vrije Universiteit Amsterdam - Faculteit der Bewegingswetenschappen - M Human Movement Sciences - 2013-2014

The one-year (60EC) programme Human Movement Sciences: Sport, Exercise & Health aims to teach students to collect and develop knowledge and understanding of human movement and to be able to apply this in the sports-, exercise- and health-related fields. The programme comprises two main tracks, namely "Sport" and "Health". Given the nature of the study, exercise will form a key part of both tracks. Both tracks are not strictly divided programmes and overlaps and switches to compose the ideal programme for each individual student are absolutely possible. The programme mainly aims at preparing students for occupations requiring a scientific background, and to a lesser extent at the preparation for a research career, although individual tracks focusing on this are feasible and possible.

Next to the two tracks, the programme offers a limited number of students (we have approximately 15 -20 places available each year), the opportunity to acquire an accreditation for teaching in Higher Education. The programme "Teaching in Higher Education" amounts to 24 EC, which can partially be incorporated into the regular programme. The programme also intends to establish links to certifications in health and exercise such as those the recognized certifications of the American College of Sports Medicine (Registered Clinical Exercise Physiologist®, Exercise Specialist® (ES) en ACSM Health/Fitness Instructor®).

The MSc diploma, when combined with a small number of additional courses will allow students access to the Postgraduate programme for Practical Sports Psychologist. This Postgraduate programme will take approximately one year (full time) and leads to accreditation as "Sportpsycholoog Vereniging voor Sportpsychologie in Nederland (r)"

Admission to the Master's programme

Students with a bachelor's degree in Human Movement Sciences (either from VU University or the RUG) or Health Sciences with a major Human Movement Sciences (UM) or Medical Sciences with a major Human Movement Sciences (Radboud Universiteit) have direct access to the master's programme HMS.

The only condition is that the student has made a rough personal planning for the Master's Programme that has been approved by the Examination Board. Bachelors of studies other than Human Movement Sciences need to meet the requirements as mentioned on the [website](#).

The Master's Programme only starts in September. Students from both our own Bachelor's programme and from other programmes are not allowed to start the Master's programme during the academic year.

Master Programme for students with a Bachelor degree other than Human Movement Sciences

For detailed information on admission requirements and procedures for students with a Bachelor degree other than Human Movement Sciences wanting to follow the Master's Programme, we refer to this [website](#).

The Master's Programme for these students normally is consistent with the regular Master's Programme.

Most students from other programmes than Human Movement Sciences have to follow a Premaster's Programme before entering the Master's Programme. Depending on the nature of the Bachelor degree of the student, the elements of the Premaster Programme are determined. The study load for the Premaster Programme may vary from 6 to a maximum of 30 credits. If more than 30 credits are required for admission to the Master's programme, students have to follow a maximum of two courses (12 credits) extra. A special fee of 150 euro per credit is charged for these additional courses.

[Overview of the programme](#)

Optional courses

The student can use the Optional credits for:

- Following one or more master courses of the other track or optional courses within the programme, or selected courses from the Research Master's Programme (note: entry for these courses might be limited);
- Courses from the Bachelor's programme, provided that the total programme comprises at least 51 EC from the master's programme.
- Elements of other master's programmes, either of VU University or another University, provided that the total programme comprises at least 51 EC from the master's programme.
- Following a Teacher Training Course. Please note that because the Teacher Training Course is 24 EC, it will result in an extended duration of the study. See www.fbw.vu.nl for the Teacher Training Course.
- Participation in one of the SOCRATES-Programmes: Exercise and Sport Psychology, Adapted Physical Activity or Development of Motor Control and Coordination. This will probably lead to extended study duration as well. It is possible that more opportunities will be present in the near future. For more information contact international-and/or

master coordinator.

-Short-literature review of 6 EC.

-Extension of the internship with 6 credits (total 30 credits).

-Practical internship of 6 EC.

The student submits his free choice elements formally to the Examination Board by means of an approval form. The approval form must be signed by the study advisor.

Approval Form

Although the students are free in choosing elements for the Optional credits, the faculty has certain requirements as to the size and the level of the chosen elements. The Free Subject Choice should, in theory, only consist of study components from the Master's programme. Study components from the Bachelor's programme for the Free Subject Choice are only applicable when they are relevant to the Master's programme. In order to establish this, the student needs to fill out the [Approval Form](#) with the element content and rough planning, which has to be signed by the study advisor for approval. In order to prevent disappointments we advise the students to hand in their Approval Forms as early as possible.

Study elements outside the Faculty

All Study Guides from VU University are available on www.vu.nl. If a student is interested in a course from another faculty, he consults the appropriate Study Guide. In case a course from another faculty requires a tuition fee the costs are, in principle, for the student, except when the faculty deems it is essential that the student follows that course.

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Docentenopleiding FBW

Vakken:

Naam	Periode	Credits	Code
Teacher Training at the Upper Secondary Level	Ac. Jaar (september)	24.0	B_DOCENTHBO

HMS1 Optional Courses

Vakken:

Naam	Periode	Credits	Code
3D-Kinematics	Periode 4	3.0	B_3DKIN
Applied Sport Psychology	Periode 3	3.0	B_APPSPRTPSY
Clinical Exercise Physiology	Periode 3	3.0	B_CLINEXERC
Electromyography	Periode 5	3.0	B_ELECTROMYO
Entrepreneurship in Human Movement Sciences	Periode 5	6.0	B_ENTREPREN
Fatigue, Aging and Disuse	Periode 5	3.0	B_FATIGUE
Intermuscular Load Sharing	Periode 6	3.0	B_INMUSCLOAD
Neurorehabilitation in the Context of Movement Sciences	Periode 4	3.0	B_NEURREHMS
Perception for Action	Periode 4	3.0	B_PERCACTION
Practical Internship	Ac. Jaar (september)	6.0	B_PracINTERN
Rehabilitation: Restoration of Mobility	Periode 3	3.0	B_REHABMOB
Short Literature Review	Ac. Jaar (september)	6.0	B_SLR
Statistics for Experimental Research	Periode 4	3.0	B_STATEXPRES
Studentbegeleiding	Ac. Jaar (september)	6.0	B_STDBEG
Talent Identification and Development	Periode 3	3.0	B_TALDEVEL
Teacher Training at the Upper Secondary Level	Ac. Jaar (september)	24.0	B_DOCENTHBO

HMS1 Health Track

Vakken:

Naam	Periode	Credits	Code
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Coordination Dynamics: Prin. Clin. Appl.	Periode 2	3.0	B_CLINCORDYN
Exercise and Health	Periode 2	3.0	B_EXERHEALTH
Health and Society	Periode 1	3.0	B_HEALTHSOC
Normal and Abnormal Motor Development	Periode 2	3.0	B_MOTORDEVEL

HMS1 Obligatory Courses

Vakken:

Naam	Periode	Credits	Code
Behavioral Concepts in Human Movement Sciences	Periode 1	3.0	B_BEHCONCEPT
Biophysical Concepts in Human Movement Sciences	Periode 1	3.0	B_BIOCONCEPT
History and Theory of Movement Sciences	Periode 1	3.0	B_HTOMS
Research Internship	Ac. Jaar (september)	24.0	B_RI

HMS1 Sport Track

Vakken:

Naam	Periode	Credits	Code
Energy Flow Models	Periode 2	3.0	B_ENERFLOW
Maximal Neuromuscular Performance	Periode 2	3.0	B_MAXNEUR
Perceptual-motor Learning	Periode 2	3.0	B_PERCML
Psychological Factors in Sport	Periode 2	3.0	B_PSYFACSPRT
Sport and Society	Periode 1	3.0	B_SPORTSOC

3D-Kinematics

Vakcode	B_3DKIN (900632)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. J. Harlaar
Examinator	prof. dr. J. Harlaar
Docent(en)	prof. dr. H.E.J. Veeger
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

The student is capable to:

- Define and calculate local joint coordinate systems;
- use and understand different calibration methods and their limitations;
- translate technical motion descriptions into clinically relevant units;
- apply the above to experimental data;
- interpret and comment on methods as described in the literature.

Inhoud vak

In this course students are introduced to the fundamentals of three-dimensional kinematics, as well as the (more or less) standard application methods.

The course will comprise three separate blocks focusing on:

1. the definition and use of local coordinate systems in the calculation of osteokinematics;
2. the use of technical marker sets as well as the practical implications of data processing, especially correcting for missing markers and;
3. the calculation procedures for obtaining helical axes, needed for the definition of functional axes-based coordinate systems.

The course consists of classes, computer practicals and work group, in which 3D kinematics theory and application will be taught and consequences for research will be discussed.

Onderwijsvorm

Lectures, computer practicals and tutorials

The three computer practicals are linked to in-term assessments. Each practical will contribute for 15% to the final score.

Toetsvorm

The assessment consists of:

- three in-term practical assignments, each contributing for 15% of the final score;
- computer test consisting of a matlab based assignment and a literature review (55%)

Literatuur

Relevant papers will be listed in Blackboard.

A useful source is the book by Zatsiorsky (Zatsiorsky, Valdimir M., Kinematics of Human Motion. Champaign, Illinois: Human Kinetics, 1st edition, 1998. ISBN 0-880110767-5), which will be used as reference material.

Vereiste voorkennis

This course requires proficiency in Matlab and matrix calculation. If there is a deficiency related to Matlab skills, students are strongly advised to take the TUE web-based matlab course that can be found at <http://www.imc.tue.nl/>

The BSc course "Mechanische Analyse ..." is advised.

Overige informatie

The maximum number of participants in this course is limited to 40.

Applied Sport Psychology

Vakcode	B_APPSPRTPSY (900671)
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. R. Canal Bruland
Docent(en)	dr. R. Canal Bruland
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

The student is capable to:

- critically assess literature about applied sport and exercise psychology on its thesis, content, empirical rigor and applicability
- link applied research to its theoretical background
- initiate applied research and formulate advice in two specific areas of applied sport psychology
- discuss research on applied sport and exercise psychology

Inhoud vak

The course "Applied Sport Psychology" provides insight into research on applied aspects of sport and exercise psychology. Following the Association for Applied Sport Psychology this comprises "three interrelated focus areas: Performance Psychology, Health and Exercise Psychology, and Social Psychology.

Health and Exercise Psychology focuses on the application of psychological principles to the promotion and maintenance of health-enhancing behaviors over the lifespan, including play, leisure physical activity and structured exercise, and the psychological and emotional consequences of those behaviors. Researchers in this area also investigate the role of exercise in disease remediation, injury rehabilitation, and stress reduction.

Performance Psychology focuses on research, theory, and practice intended to improve performance in exercise and sport. This area is also concerned with the effects of sport psychology interventions on the well-being of participants in exercise and sport.

Social Psychology focuses on individual and group processes in sport and exercise settings. This area applies social psychological principles in examining factors related to the sport participant, coach, team, and spectator" (see <http://appliedsportpsych.org>).

The course provides insights into all three domains.

Onderwijsvorm

Contact 12 hours (five lectures/ seminars, in total 10 hours, one practical, 2 hours); self study, practical report and paper, in total 68 hours.

The course literature is presented and critically discussed in the lectures and seminars. A practical is organized to experience and apply 'performance profiling' and 'mental imagery'. After the practical students have to prepare and submit their practical reports.

Furthermore, the students produce a paper on a self-chosen topic (from

a list of topics that will be provided in the course manual) in applied sport and exercise psychology.

Toetsvorm

Students produce a paper in groups of two (100% of the final mark). In relation to the Practical, students produce a short practical report (summary). All products must be of sufficient quality to pass the course.

Literatuur

- Course manual made available on Blackboard.
- Recent articles and book chapters on applied aspects of sport and exercise psychology (will be provided in the first lecture).

Vereiste voorkennis

Students are expected to be familiar with contents of Sport Psychology. It is therefore recommended that students have participated in the course "Psychological Factors in Sport".

Aanbevolen voorkennis

Students are expected to be familiar with contents of Sport Psychology. It is therefore recommended that students have participated in the course "Psychological Factors in Sport".

Overige informatie

Max students : 60

Behavioral Concepts in Human Movement Sciences

Vakcode	B_BEHCONCEPT (900662)
Periode	Periode 1
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. J.B.J. Smeets
Docent(en)	prof. dr. P.J. Beek
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

The student is able to describe course aims in formal format, divided in the categories:

- reporting the key behavioral concepts in contemporary Human Movement Science;
- applying these concepts in describing research outcomes;
- judging the (dis)advantage of using a concept in a particular situation.

Inhoud vak

Human movement is a complex behavior. To interpret this complex behavior, the scientific literature uses concepts that are rather complex themselves. Examples of such concepts are information,

stability, synergy, internal representation and motor programs. In this course, questions such as "What do these concepts mean exactly?" and "How do these concepts help us to understand the behavior we observe?" are addressed.

Onderwijsvorm

Amount of hours, divided in:

Lectures (' hoorcolleges') 16

Self study 48

Assignments (including essays) 20

Students prepare for a lecture (except for the first lecture) by reading two papers and making a short assignment. After four lectures, students choose one of the papers to write an essay. After the last lecture, students write a second essay.

Toetsvorm

Short assignments for each lecture (15%)

Essay halfway during course (35%)

Final essay (50%)

Literatuur

Various scientific publications are used, further information is provided during the course.

Vereiste voorkennis

No specific entry requirements.

Overige informatie

The two essays should each have a length of less than 1000 words

Biophysical Concepts in Human Movement Sciences

Vakcode	B_BIOCONCEPT (900663)
Periode	Periode 1
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. J.H. van Dieen
Docent(en)	prof. dr. T.W.J. Janssen
Lesmethode(n)	Hoorcollege
Niveau	500

Doel vak

The student knows the mechanical concepts that apply to control of joint position and movement, in particular equilibrium, stability, robustness, performance, and observability.

The student understands these concepts and can explain how they are related to clinical problems and to motor control in patients with joint disorders.

The student knows the physiological concepts of relative workload in sports and clinical research and training, in particular, (sub)maximal force/power generation, (sub)maximal energy expenditure,

aerobic/anaerobic metabolism, blood flow, and anaerobic threshold. The student understands these concepts and can explain how they are related to sports and rehabilitation research and practice.

Inhoud vak

In this course the students are acquainted with biophysical concepts that underlie current debates in HMS.

One part of the course deals with biomechanical concepts in particular with (in-)stability of joints and joint movement. Instability is often used in the clinical setting to describe the state of the joint after injury or in degenerative disorders. The term is often poorly defined, which leads to confusion in the communication between disciplines, e.g. between physiotherapists and orthopedic surgeons. Mechanics and control theory provide a rigorous framework for describing joint function. The relevance of this conceptual framework for the clinical context and the implications for diagnosis and treatment will be discussed.

The other part of the course deals with physiological concepts in particular with the use of relative workload. Relative workload is often used to induce similar loading of persons in sports and clinical studies, either to measure endurance or to induce a certain training stimulus. Relative workloads as percentage of maximal force/power or energy utilization (oxygen uptake) are used in various circumstances. While the choice for a given variable is essential for the result, it will be discussed whether the proper variables are chosen for the specific goals.

Onderwijsvorm

23 contact hours, divided in:

Lectures 10 * 2 hours

Assessment 3 hours

57 hours self study

The course consists of two series of lectures dealing with biomechanical and physiological concepts respectively. In the first lecture of the two series a general introduction will be given. In the second and third lecture of each series, the formal concepts will be introduced and explained and related to the applications in sports and health. In the fourth lecture questions by the students will be discussed.

Toetsvorm

- written test with open-ended questions.

Literatuur

- Research articles and review papers will be made available at the start of the course

Vereiste voorkennis

The student should have a basic knowledge and understanding of the human musculoskeletal anatomy and biomechanics and of exercise and muscle physiology.

Clinical Exercise Physiology

Vakcode	B_CLINEXERC (900670)
Periode	Periode 3

Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. C.C. Foster Jr.
Lesmethode(n)	Hoorcollege, Practicum, Werkcollege
Niveau	400

Doel vak

To provide the student with the fundamental knowledge of clinical exercise physiology as a variant of normal exercise physiology, which will enable the student to apply this knowledge in preventive and rehabilitative exercise programs.

Inhoud vak

Basic didactic information and laboratory experiences of the effect of pathophysiologic conditions on human energy metabolism and health. The focus will be on organ systems and their linkage to ATP generating pathways and on how this influences skeletal muscle performance. The application is to the use of exercise both diagnostically and as a therapeutic tool. After this course the student will have the fundamental knowledge and skills to use exercise in patients with cardiopulmonary/metabolic disease and to work cooperatively with other health care providers.

Onderwijsvorm

Lecture
Practical laboratory exercises
Directed reading

Toetsvorm

multiple choice

Literatuur

A selection of articles and practical guide on BlackBoard

Vereiste voorkennis

Toegepaste Inspanningsfysiologie.

Coordination Dynamics: Prin. Clin. Appl.

Vakcode	B_CLINCORDYN (900666)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. M. Roerdink
Docent(en)	dr. M. Roerdink
Lesmethode(n)	Hoorcollege, Computerpracticum, Practicum
Niveau	400

Doel vak

The student is acquainted with the principles, concepts and methods of coordination dynamics, as used in the study of basic and pathological

movements. The student can explain these aspects of coordination dynamics in a qualitative manner and is able to indicate how they may contribute to clinical diagnosis and intervention.

Inhoud vak

The coordination dynamics approach is pursued to study how patterns of coordinated movement come about, persist and change as a function task constraints, learning, expertise and pathology. Coordination dynamics is governed on the one hand by principles of self- organization, and on the other hand by intentionality, perceptual information and explicit knowledge.

Coordination patterns exist at multiple levels:

1. dynamics within or between body segments of a moving person;
2. dynamics between moving segments of multiple persons and
3. dynamics between person and external events, as well as between persons.

The first part of the course provides an overview of the principles, concepts and methods of coordination dynamics.

The second part of the course focuses on the application of coordination dynamics in a clinical (rehabilitation) setting, with specific emphasis on pathological gait and interventions based on environmental coupling. Specifically, coordination dynamics provides a framework to study the nature of healthy and pathological movements by assessing stability and loss of stability of coordination patterns, thereby assisting the diagnosis and evaluation of rehabilitation-induced changes in coordination. Furthermore, coordination dynamics may promote therapeutic interventions based on environmental coupling, aimed at facilitating desired coordination patterns and/or stabilizing existing unstable coordination patterns.

Onderwijsvorm

Amount of contact hours, divided in:

Lectures: 8 * 1.75 hrs

Laboratories: 2 * 2.00 hrs

Computer Practicals: 5 * 2.00 hrs

Exam: 2.75 hrs

Part 1: Principles of coordination dynamics

- Lecture 1: How nature handles complexity: self-organization of behavior
- Lecture 2: Coordination dynamics at multiple levels
- Lecture 3: Tools and methods of coordination dynamics
- Laboratory 1: Relative phase and phase transitions in action
- Practical 1: Analyses of rhythmic interlimb coordination
- Practical 2: Analyses of rhythmic sensorimotor coordination

Part 2: Clinical applications of coordination dynamics

- Lecture 4: Introduction to clinical coordination dynamics
- Lecture 5: Interventions based on environmental coupling
- Laboratory 2: Clinical coordination dynamics in action
- Practical 3: Functional changes in interlimb interactions following stroke
- Practical 4: Pathological gait modulation with visual and acoustic cues
- Lecture 6: Coordination dynamics and pathological gait
- Lecture 7: Coordination dynamics in the future
- Practical 5: Optional class for questions and feedback
- Lecture 8: Feedback on Laboratories and Practical plus discussion on example exam questions

The practical exercises aim to apply the principles of coordination dynamics to concrete experimental and clinical settings. The Laboratories entail hands-on experience with examining rhythmic interlimb and sensorimotor coordination as well as assessments and interventions involving environmental couplings in rehabilitation practice. The computer practicals are included to become acquainted with the handling and interpretation of the gathered data using methods of coordination dynamics (Matlab scripts and functions are provided; no programming skills required). Note that Laboratory 2 will be held at the Duyvensz-Nagel Research Laboratory of Reade Center for Rehabilitation and Rheumatology (DNO, Reade, Overtoom 283).

Toetsvorm

Interim (20%) and final (80%) written exam, consisting of a combination of open questions and true/false statements

Literatuur

A selection of relevant book chapters and articles.

Electromyography

Vakcode	B_ELECTROMYO (900815)
Periode	Periode 5
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. ir. D.F. Stegeman
Docent(en)	prof. dr. J.H. van Dieen, prof. dr. ir. D.F. Stegeman
Lesmethode(n)	Hoorcollege, Practicum, Computerpracticum
Niveau	400

Doel vak

- The student has a basic knowledge of electrophysiology and the background of electromyographical; signals;
- the student has a basic knowledge of the different ways; of collecting electromyographical data in various application fields;
- the student can collect and analyze EMG data for kinesiological use;
- the student can choose the appropriate method for collecting EMG data in kinesiological study;
- the student knows the possibilities and limitations of EMG data;
- the student can interpret EMG data in relation to motor control, force and fatigue;
- the student can identify contamination in EMG data and can apply methods to reduce its effects;
- the student knows the standards for reporting EMG data.

Inhoud vak

In this course, the students are introduced to the electrophysical background of electromyograph (EMG). Subsequently, the course focuses on methodological aspects of EMG acquisition and analysis, focusing on the potential of this method as well as its pitfalls.

Onderwijsvorm

lectures 6 x 2 hours

practical 3 x 3 hours (incl. 1*3 hours in Nijmegen in between the two others)

The lectures introduce the following topics:

- electrophysiology;
- motor control (motor unit recruitment and firing);
- instrumentation and electrodes;
- HD- EMG and spatio- temporal information;
- onset determination;
- amplitude estimation;
- force estimation;
- cocontraction and cross- talk;
- motor unit firing and decomposition;
- frequency content, conduction velocity and fatigue.

Practicals concern measuring EMG, analyzing EMG data.

Toetsvorm

2 hours; written test with equally weighted open- ended questions

Literatuur

Research articles and lecture handouts to be made available before the course

Vereiste voorkennis

- knowledge of and skills in programming in MATLAB at the level described for example in 'Verwerken van digitale signalen'.
- basic knowledge and understanding of the physiology of muscles and their control.

Overige informatie

Maximum number of students: 40

Energy Flow Models

Vakcode	B_ENERFLOW (900675)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. J.J. de Koning
Docent(en)	dr. J.J. de Koning
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

To provide the student with knowledge about energy flow models, and so to enable the student to apply this knowledge in the modelling of human endurance performance.

Inhoud vak

Research in which exercise physiology and biomechanics are combined as a 'toolbox' is apparently unique and successful. This course familiarizes the student with one branch of this approach. Energy flow models, based on power equations, will be used to study performance determining factors in endurance sports. This course explains the technique of

modelling, how parameter values are obtained from experiments and how simulations with the model can be done. The student will construct a model of an endurance athlete to study the effect of parameter values on performance in cycling, speed skating and running. The models will be made in MATLAB. Knowledge of MATLAB is necessary to be successful in this course.

Onderwijsvorm

Lectures and guided practical;
34 hours (28 practical, 6 lecture).

Toetsvorm

Written examination and practical report (30%/70%).

Literatuur

A selection of articles and practical guide on Blackboard.

Vereiste voorkennis

900104: Biomechanica (Students are expected to have sufficient knowledge of this subject);

900215: Mechanische analyse van het menselijk bewegen (Students are expected to have sufficient knowledge of this subject)

Entrepreneurship in Human Movement Sciences

Vakcode	B_ENTREPREN (65412020)
Periode	Periode 5
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. E. Masurel
Docent(en)	prof. dr. E. Masurel
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

Students obtain knowledge about and insight in the relevance of entrepreneurship and innovation for their own discipline. Students learn about the processes which are involved in the recognition and exploitation of opportunities, about creating economic and social value and about the nature and role of networks. In addition students gain knowledge of different entrepreneurial processes and the importance of valorization of findings and business ideas for a knowledge-based economy.

Inhoud vak

This course consists of two tracks: a theoretical track and a practical track. These two tracks run simultaneously.

In the first track you learn about entrepreneurship. Answers are found on questions such as: what is entrepreneurship? What defines an entrepreneur? What are entrepreneurial opportunities? What is the role of innovation in entrepreneurship? What is corporate social responsibility (CSR)? How can we judge the feasibility of

entrepreneurial ambitions?

Simultaneously you work on an assignment (second track). In the first week of this course you search for an innovation in your own discipline (product, service, process etc.). Your choice must be approved by the lecturers. The first part of the assignment consists of a description of the innovation which you have chosen. Subsequently, you make a SWOT analysis and a network analysis of the innovation. Also a paragraph of CSR should be added. The final part of the assignment is your own feasibility study: how would you valorize the innovation to the market.

Onderwijsvorm

Lectures and workshops. Each week scientific lectures or practical workshops are given. These lectures are both the basis for the exam and for the assignment.

Toetsvorm

You conduct a written exam and an assignment. Both the exam and the assignment will determine 50% of the grade. The exam and the assignment must be of sufficient quality.

Literatuur

The course manual contains a list of online available articles.

Overige informatie

Optional course for Master students 'Human Movement Sciences' 'Sport, Exercise & Health', 'Fundamental and Clinical Movement Sciences'.

Exercise and Health

Vakcode	B_EXERHEALTH (900667)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. E.A.L.M. Verhagen
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

The main objective of this course is to provide the students with the necessary tools to critically acclaim, discuss and understand the relationship between exercise and health.

By the end of this course the student is able to ...

- critically discuss (recent) literature on the relationship between exercise and health in a written report, culminating in an evidence based guideline towards preventive interventions
- critically assess (recent) literature on the relationship between exercise and health on its thesis, content, empirical rigor and applicability;
- deduct gaps in scientific knowledge; which hampers proper implementation of interventions in the field of practice
- to apply methodological principles of epidemiological research that apply to exercise and health research
- critically assess and discuss papers of fellow students on contents,

structure, writing methodological rigor and originality

Inhoud vak

The overall aim of this course is to provide students with specific scientific knowledge on the methodology of health and exercise research, and to stimulate students to apply these techniques on a given exercise and health related issue.

Based on this baseline knowledge students will tackle, in small working groups, either a contemporary exercise related 'health' issue (e.g. type II diabetes) or an exercise related 'injury' issue (e.g. ACL injury). Each group will produce a paper in which the lectured methodology is used, working towards an guideline for prevention.

Onderwijsvorm

There are 2 lectures and 6 seminars on the topic of exercise and health. In addition students will write a design paper on a given topic in exercise and health, and they will present their paper in a poster presentation.

Toetsvorm

Students produce a design paper (80%) and poster presentation (20% of the final grade). The paper and poster presentation must at least be of sufficient quality to pass the course.

Literatuur

Course manual (available on blackboard)
Sheets provided during the course
Articles provided during the course

Suggested background literature ...

EALM Verhagen and W van Mechelen, eds. Sports Injury Research. Oxford University Press, Oxford. 2010: ISBN 9780199561629.

Vereiste voorkennis

Fundamental knowledge about statistical techniques is strongly advised. These techniques are explained in chapters 1 through 3 of the mentioned 'background literature' reading. These techniques will not be further explained during the course.

Overige informatie

The last seminar is obligatory.

Fatigue, Aging and Disuse

Vakcode	B_FATIGUE (900648)
Periode	Periode 5
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. R.T. Jaspers
Docent(en)	prof. dr. A. de Haan, dr. R.T. Jaspers
Lesmethode(n)	Werkcollege, Hoorcollege
Niveau	400

Doel vak

At the end of this course the student has knowledge of the short term changes in the physiology of the neuromuscular system, as induced by fatigue and long term adaptations as a result of disuse and aging, and the underlying (molecular) mechanisms. The student can apply this knowledge to questions regarding human movement in various situations (e. g. sports, aging, illness, injury, disorders).

Inhoud vak

During the course, a critical overview is given of the current knowledge of short and long term adaptations of the neuromuscular system. The manifestation and (metabolic) mechanisms of neuromuscular fatigue during high intensity exercise is addressed using own research examples. Neuromuscular performance is impaired during aging and with a chronic decrease in usage, such as during bed rest, diseases, injuries, neuromuscular disorders and (most extreme) after a spinal cord injury. Underlying (molecular) processes leading to decreased performance of the neuromuscular system are discussed, mostly based on ones recent own research.

Onderwijsvorm

The course will consist of a series of lectures during which relevant questions are addressed and discussed. In additional meetings relevant items are addressed in group discussions based on prepared questions/statements.

Toetsvorm

Assessment

Written test with open- ended questions.

Literatuur

Book chapters, research articles and review papers to be made available before the course.

Vereiste voorkennis

The student should have a basic knowledge and understanding of molecular, biology, exercise and muscle physiology.

Health and Society

Vakcode	B_HEALTHSOC (900664)
Periode	Periode 1
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. M.B.M. Soethout
Docent(en)	dr. M.B.M. Soethout
Lesmethode(n)	Hoorcollege, Practicum
Niveau	500

Doel vak

The students are able to demonstrate knowledge and understanding of:

- the important determinants of health and disease in the general population;

- the goals, strategies and principles for health promotion in a general and specific population (primary, secondary and tertiary prevention);
- the fundamentals of different health systems and their goals and functioning in practice;
- priority setting and decision making in the development and implementation of public health programs.

Inhoud vak

Lectures will provide an introduction in the theory and practice of important topics in public health: health policy and care systems, health monitoring, and health prevention and promotion. These topics will be further illustrated and discussed in a case-oriented tutorial. Also a critical analysis of a public health report is discussed in a tutorial. The students (in couples) then select a topic of interest (e.g. development or implementation of a program for health promotion) for further study, presentation and a final paper.

Onderwijsvorm

- Lectures (3 x 2 hours and 1 x 3 hours), and tutorials (3 x 2 hours and 1 x 4 hours)

Toetsvorm

Structured paper & presentation on a self chosen public health topic.

Literatuur

We advise students to read the book: Gillam, Yates & Padmanabhan. Essential Public Health. Theory and Practice. Cambridge University Press 2007.

Obligatory papers: will be provided during the course.

Vereiste voorkennis

The students must be familiar with the content of the book: Gillam, Yates & Padmanabhan. Essential Public Health. Theory and Practice. Cambridge University Press 2007.

Overige informatie

Examination format structured paper, peer review of a paper and presentation.

Teaching staff:

dr. M. Soethout

dr. M.C. de Bruijne

dr. N. Evans

dr. J. Voordouw

dr. M. Hoogsteder

History and Theory of Movement Sciences

Vakcode	B_HTOMS (900661)
Periode	Periode 1
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. O.G. Meijer
Docent(en)	dr. O.G. Meijer

Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

Students will be confronted with the overall development of movement science, and thereby better understand its central problems. A systems theory analysis is used to highlight the problem of relationships between different levels. Students are trained in critical reading of published papers.

Inhoud vak

Lectures: Introduction into the history of movement sciences, the relevance of systems theory, and the problem of the relationship between levels. Discussion in small groups: learning to discuss and analyze movement science papers.

Onderwijsvorm

Lectures, discussion groups. Students who attend all discussions in small groups on movement science papers, and who have prepared these discussions appropriately, are exempted from the corresponding part of the written examination.

Toetsvorm

Written examination.

Literatuur

Lecture notes.

Intermuscular Load Sharing

Vakcode	B_INMUSCLOAD (900809)
Periode	Periode 6
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. J.H. van Dieen
Docent(en)	prof. dr. J.H. van Dieen, dr. H. Maas
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

- The student is able to explain the most common methods for inverse mechanical analysis of muscle-joint systems and is able to apply these.
- The student is able to describe the possibilities and limitations of these methods.
- The student is able to describe recent insights on mechanical and neural connectivity between muscles and can integrate these insights into the inverse mechanical analysis.
- The student is able to assess the validity and sensitivity of such methods and can interpret and report results in a scientific format.

Inhoud vak

In this course, the students are introduced to methods to estimate the mechanical load on structures in a muscle-joint system through inverse mechanical analysis. Since muscle-joint systems are mechanically indeterminate, estimating the distribution of the net moment over moment-producing structures (mainly muscles) is the main challenge. The course consists of three major subjects. First, after a general introduction on modeling and model validation, EMG driven and optimization models for estimating the distribution of the net moment over muscles will be dealt with and data on load sharing as measured in animal experiments will be discussed in the context of such models. During a computer lab students will modify and use a simple model of a muscle-joint system driven by optimization. Second, the mechanical and neural connectivity between muscles will be introduced in a lecture. In the subsequent computer lab, the model will be adapted to study the effects of intermuscular force transmission and neural overflow. Third, a formal analysis of joint stability will be introduced and the effects of stability requirements on load sharing between muscles will be discussed. In the following computer lab, students will apply stability constraints in the model to further study these effects. Based on sensitivity analyses for specified inputs, parameters, or model assumptions with the model, students will prepare a written report with respect to a self-selected question related to one of the three parts of the course.

Onderwijsvorm

Lectures 11 hours
Reading articles 8 hours
Article assignment 4 hours
Computer labs 6 hours
Preparing presentation 3 hours
Final assignment 52 hours

Toetsvorm

Students, in groups of two, write a written report based on the topic of one of the three computer labs (optimization criteria, intermuscle connectivity, stability constraints). They phrase a research question and hypothesis with respect to this topic and perform the analyses needed to answer the question. First a proposal is written and submitted for feedback. The report should have the format of a research paper. However, the introduction section should be limited to a minimum (i.e., one paragraph; ~200-300 words), including the research question and hypothesis. The report should describe in detail which analyses were performed using which models (methods) and provide the results of the analyses. The discussion should incorporate relevant methodological literature and literature concerning the question at hand. The total number of pages should not exceed 20 excluding references.

Literatuur

A series of papers will be made available at the start of the course.

Vereiste voorkennis

- The student should have a basic knowledge and understanding of the human musculoskeletal anatomy as described for example in Human Anatomy. E.N. Marieb & J. Mallatt (Eds.), Benjamin-Cummings Publishing Company, 3rd edition, ISBN: 0-8053-5335-6, chapters 1.1-1.16; 4.88-4.102; 4.99-

4.102; 9.212-9.239; 10.244-10.253; 11.266-11.270.

- The student should have knowledge and understanding of biomechanics (at the level described for example in Kinetics of Human Motion. V. M. Zatsiorsky (Ed.), Human Kinetics, 1st ed. 2002, Chapters 1-5.
- The student should have a basic knowledge and understanding of the physiology of muscles and their control at the level described for example in Physiology of Sport and Exercise, J.H. Willmore & D.L. Costill (Eds.), Human Kinetics, ISBN 0-87322-693-3, chapters 2-3.
- The student should have knowledge of and skill in programming in matlab at the level described for example in: Signalen in beweging - het verwerken van digitale signalen met MATLAB. T. de Haan (Ed.), Faculteit der Bewegingswetenschappen Vrije Universiteit Amsterdam, zevende druk, zomer 2011 or the English translation (both available on blackboard sites of the VU University, Faculty of Human Movement Sciences) or as described in Engineering problem solving with MATLAB, D. M. Etter (Ed.), Prentice-Hall, International, Inc. ISBN 0-13-520891-2, chapters 2 – 4.

Aanbevolen voorkennis

- The student is able to explain the most common methods for inverse mechanical analysis of muscle-joint systems and is able to apply these.
- The student is able to describe the possibilities and limitations of these methods.
- The student is able to describe recent insights on mechanical and neural connectivity between muscles and can integrate these insights into the inverse mechanical analysis.
- The student is able to assess the validity and sensitivity of such methods and can interpret and report results in a scientific format.

Overige informatie

Max Students : 30

Maximal Neuromuscular Performance

Vakcode	B_MAXNEUR ()
Periode	Periode 2
Credits	3.0
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. C.J. de Ruiter
Docent(en)	dr. C.J. de Ruiter
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

The student has knowledge of the role of muscle activation and (changing) muscle properties on maximal human neuromuscular performance during high intensity exercise and the student has knowledge of the relevant research methods.

The student can apply this knowledge to questions regarding testing and improving of maximal neuromuscular performance in sports (and rehabilitation).

The student is able to evaluate the validity and relevance of basic scientific literature for neuromuscular performance in a sport (rehabilitation) related context.

The students will learn to critically read scientific papers on neuromuscular performance published in international journals. The student will be able to communicate ('translate') the implications of basic scientific knowledge of neuromuscular performance to practical issues raised by coaches and therapists in the field of sports (and rehabilitation).

Students will not learn how to do research, or how to test athletes, or how to design exercise programs in sports or rehabilitation etc.

Students will learn what underlying factors/mechanisms they should be aware of while designing muscle function tests and exercise programs.

Inhoud vak

During the course, a critical overview will be given of the current knowledge of maximal neuromuscular performance during relatively high intensity exercise of short duration (40 ms up to 5 min). Most examples will be provided from own research. The emphasis will be on the coupling between basic knowledge of muscle activation and (changing) muscle properties during human movement and their consequences for testing and training. This is a fundamental sports related muscle physiology course but not an applied sports course.

The following subjects will be addressed:

- Voluntary activation;
- Explosive force/power;
- Influence of temperature (incl. warm-up);
- Potentiation;
- (Low frequency) fatigue;
- Shortening deficit and lengthening force enhancement;
- Recruitment of motor units.
- Muscle oxygenation

Onderwijsvorm

The course will consist of a series of nine lectures, during which relevant practical questions will be used as a starting point, subsequently the focus will be on fundamental neuromuscular properties as studied in a series of accompanying scientific papers.

Toetsvorm

2.5-hour exam with open-ended questions.

Literatuur

The course will mainly use research papers. Basic background information is derived from Chapters 1-8 of: Skeletal muscle: from molecules to movement. A textbook of muscle physiology for sport, exercise, physiotherapy and medicine. Jones, D.A., Round, J. and A. de Haan, Edinburgh: Churchill Livingstone, Elsevier Science Limited, 2004. ISBN 0 443 07427 5

Vereiste voorkennis

Sufficient knowledge of the basics of Muscle Physiology is absolutely necessary. In order to successfully participate, the students have to understand the following concepts: anatomy of skeletal muscle, sarcomere function, twitch, tetanus, length-force, force- and power-velocity, and stimulation frequency-force relations, the size principle of motor unit

recruitment, rate coding, EMG, electrical stimulation, fibre type related differences in contractile properties, cross-bridge kinetics, excitation contraction coupling, the basic metabolic changes during exercise (changes in ATP and CrP, glycolysis, oxidative phosphorylation)

Neurorehabilitation in the Context of Movement Sciences

Vakcode	B_NEURREHMS (900659)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. G. Kwakkel
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

The student is capable to:

- understand mechanisms of functional recovery related to stroke;
- understand the pathophysical processes and symptoms that characterize stroke, Parkinson's Disease and Multiple Sclerosis;
- understand clinical decision making in neurorehabilitation for management of patients with stroke, Parkinson's Disease and Multiple Sclerosis;
- acknowledge the importance of ICF- model in rehabilitation medicine.

The student is able to:

- interpret the clinical relevance of selected measurements of outcome;
- categorize measurements of outcome used in rehabilitation medicine;
- understand the clinical decision making process for functional prognosis in Multiple Sclerosis, Parkinson's Disease and stroke.

Inhoud vak

Within eight lectures the significance of movement science in the field of neurorehabilitation is elucidated. Practical examples are given on how theories on motor control, perception and behavior can be applied in clinical research. On the other hand, the emphasis of these lectures is placed on how movement scientists may collaborate in clinical research of patients with neurological diseases such as stroke, Parkinson's Disease and Multiple Sclerosis. In order to improve knowledge transfer from preclinical to clinical research (i. e., translational research), students will be educated in the state of art about the underlying mechanisms of functional recovery and the role of adaptive motor control in mentioned neurological diseases.

Onderwijsvorm

lecture

8 lectures

Lectures in blocks of 2 x 50 minutes.

Toetsvorm

50 multiple- choice questions. Re- examination will consist of 3 to 4 open ended questions (written test).

Literatuur

Manuscripts (SCI) will be downloadable from BlackBoard.

Vereiste voorkennis

Students should have knowledge and understanding of ICF model in rehabilitation medicine.

Normal and Abnormal Motor Development

Vakcode	B_MOTORDEVEL (900668)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. A. Ledebt
Docent(en)	dr. A. Ledebt
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	400

Doel vak

Students should be able to identify, summarize, critically evaluate and expand upon topics regarding the development of perceptual-motor behavior in normal and populations at high-risk for abnormal motor development. Students are acquainted with different types of qualitative motor assessments and instruments to quantify motor performance. They are able to identify early alarm signals and describe the advantages and disadvantages of several tools to diagnose disorders involving motor problems. They are able to describe perceptual and motor problems of several developmental disorders (e.g. cerebral palsy, developmental coordination disorder).

Inhoud vak

The course deepens the understanding of normal and abnormal motor development and developmental disorders in fetuses, infants and young children. Lectures and tutorials provide insight into actual problems in the research and practice of perceptual-motor development, particularly in the area of health sciences. The lectures present an overview of the developmental disorders in which motor problems are either defining characteristics (i.e., cerebral palsy) or form part of a larger spectrum of difficulties (i.e., autism, ADHD). Symptoms will be described and diagnostic criteria will be discussed. The main rehabilitation methods will be related to theories on development.

During tutorials the students learn to discriminate abnormal from normal movements in fetuses, infants and young children and are introduced to different types of measurement tools used to quantify motor performance.

Onderwijsvorm

Final written exam. Attending the tutorials and writing the reports linked to them are compulsory. The reports and the critical review have to be marked as "pass" by the lecturer.

9 lectures en 2 tutorials (2 hours each)

Toetsvorm

Final written exam with open-ended questions. Attending the tutorials is compulsory. The critical review has to be marked as "pass" by the lecturer.

Literatuur

Reader.

Vereiste voorkennis

Bases in neurophysiology and neuroanatomy.

Perception for Action

Vakcode	B_PERCACTION (900810)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. J.B.J. Smeets
Docent(en)	prof. dr. J.B.J. Smeets
Lesmethode(n)	Hoorcollege, Computerpracticum
Niveau	500

Doel vak

The student is able to:

- describe the functioning of the sensory systems relevant for motor control;
- interpret scientific literature in the area of perception and apply it to the field of motor control.

Inhoud vak

The topic of this course is the question: how is sensory information processed to guide ones action? More specific: how do we know where a target and (a part of) our body is? The answers to these questions require knowledge about the sensory organs, their signals, and how these signals are processed and combined in order to be used to control our actions. Each topic (e.g. proprioception, binocular vision) is introduced by a lecture, but the focus of the course is on the discussion of papers of the last decade. The discussion will be about both the phenomenology and the mechanisms.

Onderwijsvorm

Amount of contact hours:

Lectures (' hoorcolleges') 7

Tutorials (' werkcolleges') 7

Assignments & self study 68

Practicals 2

Each meeting will be a combination of tutorial consisting of a discussion of the previous assignment (1 hour), and a lecture introducing to the topic of the next assignment (1 hour)

In the practical, the students will compare two psychophysical

techniques and discuss their effectiveness in answering the question what perceptual information is available.

Toetsvorm

After each lecture, students receive an assignment. Six of them have to be handed in before the next meeting. These assignments are graded, and count for 10 % of the final grade. The assignment after the final lecture will contribute 35 %: the remaining 5% on completion of the practical.

Literatuur

Literature needed for the course will be distributed during the course.

Vereiste voorkennis

No entry requirements. Basic knowledge of the nervous system is expected (e. g. function of various brain areas).

Overige informatie

- The maximum number of participants in this course is limited to 40

Perceptual-motor Learning

Vakcode	B_PERCML (900682)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. G.J. van der Kamp
Docent(en)	dr. G.J. van der Kamp
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

- The student is capable to describe, summarize and compare the key concepts, experimental methods, and empirical evidence for contemporary theories of perceptual- motor learning;
- The student is capable to apply knowledge from contemporary theories of perceptual- motor; learning to provide insight; into concrete problems and common habits in the practice of sport and rehabilitation with respect to perceptual- motor learning;
- The student is capable to critically assess and evaluate the underlying assumptions and empirical evidence for the contemporary theories of perceptual- motor learning. The student is able to evaluate the applied value of the contemporary theories for the practice of perceptual- motor learning in sports and rehabilitation;
- The student is capable to orally present a concise summary of the main contributions of contemporary theories of perceptual- motor learning for applications in practice of sports and rehabilitation. The student is capable to contribute to discussions regarding the applied value of the contemporary theories for the practice of sports and rehabilitation.

Inhoud vak

The course provides a capita selecta of contemporary theories of perceptual- motor learning, such as the ecological approach (e.g.,

Gibson, 1979), common- coding approach (e.g., Prinz, 1997) and neuropsychological approaches to perceptual- motor learning (e. g., Willingham, 1998). Besides a concise overview of the key concepts, hypothesis and experimental methods and empirical support for these theories, the course addresses the significance and (possible) applications of these theories for the practice of sports and rehabilitation.

Onderwijsvorm

lecture
tutorial

Three lectures provide the student with an introduction into the three contemporary approaches to perceptual- motor learning. The lectures give a short background to the theories and provide a critical discussion of the key concepts and empirical evidence. During the tutorials the student applies the contemporary theories to the practice of perceptual- motor learning in sports and rehabilitation by proposing theory- derived solutions to 'problems from practice'. Assessment 40 hours and for preparation tutorials 20 hours.

Toetsvorm

The student receives two marks. First, each student writes a short essay that discusses an application of the contemporary theories of perceptual- motor learning to the practice of sports and rehabilitation. Second, the course will be concluded with a written exam consisting of open- end questions. The mean of these marks gives the final mark for the course. Neither of the partial marks is allowed to be below a six.

Literatuur

A collection of recent theoretical and experimental papers from the scientific literature (details to be announced).

Vereiste voorkennis

The student is familiar with the type of problems and questions that are addressed in theories and research of perceptual- motor coordination, control and learning. The student is able to independently search for, acquire and report knowledge from contemporary scientific papers.

Overige informatie

Maximum number of students: 50

Practical Internship

Vakcode	B_PracINTERN (900680)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen

Doel vak

The course is intended to introduce students to a company, institute or organization with the aim of gaining insight into the way Human Movement Science can be applied within a company, institute or organization or

otherwise be applied in such a way that the student can make an optimal impression for the sector concerned within the job market.

Inhoud vak

Practical internships can be taken at various companies, institutes or organizations, which is why there can be considerable differences regarding the content of the internship. Generally speaking students will receive a written assignment containing, in any case, what is expected of the student within the framework of the internship. The student is expected to become familiar with the activities within the company, institute or organization, as well as gaining insight into the role of their assigned department within the organization. This includes evaluating which Movement Sciences aspects are applied within in the department and which aspects could be applied in the future.

Psychological Factors in Sport

Vakcode	B_PSYFACSPRT (900676)
Periode	Periode 2
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. R.R.D. Oudejans
Docent(en)	dr. R.R.D. Oudejans
Lesmethode(n)	Hoorcollege, Werkcollege, Bijeenkomst
Niveau	400

Doel vak

The student is able to:

- give an overview of several psychological factors that play a role in sport, the assumed working mechanisms as well as ways of influencing these factors with mental training;
- critically assess (recent) literature about psychological factors in sport and sport psychology on its thesis, content, empirical rigor and applicability;
- critically discuss (recent) literature about psychological factors in sport and sport psychology in a written report, culminating in the evaluation of the literature and a discussion of implications for sport (psychology) practice;
- critically assess and discuss papers of fellow students on contents, structure, writing and originality.

Inhoud vak

In this course several psychological factors that determine performance in sports will be discussed with special focus on the topics that are crucial in sports practice and have a prominent place in research at the Faculty of Human Movement Sciences. These are anxiety, choking under pressure, training under pressure, attentional control, and visual attention training. Other than that the content is for a large part determined individually as each student writes a paper on a key topic in sport psychology.

Onderwijsvorm

lecture 5 times 2 hours

discussion tutorial 1 meeting 4 hours

There are several lectures on topics in sport psychology. Other than that students will produce an individual paper on a topic in sport psychology and reviews of the papers of their fellow students.

Toetsvorm

Students produce a paper (80%) and reviews about papers of other students (20% of the final grade). The paper and reviews must at least be of sufficient quality to pass the course.

Literatuur

- Course manual (available on Blackboard);
- Recent articles and book chapters on psychological factors in sport and sport psychology.

Background literature:

- Cox, R.H., Sport Psychology: Concepts and Applications, 6th edition. Boston: McGraw-Hill, 2007.

or

- Bakker, F.C. & Oudejans, R.R.D. (2012). Sportpsychologie. Nieuwegein: Arko Sports Media.

Vereiste voorkennis

Students should have basic knowledge and understanding of sport psychology as is available in textbooks such as Cox, R.H. (2007). Sport Psychology: Concepts and Applications, 6th edition. Boston: McGraw-Hill, or Bakker, F.C. & Oudejans, R.R.D. (2012). Sportpsychologie. Nieuwegein: Arko Sports Media.

Rehabilitation: Restoration of Mobility

Vakcode	B_REHABMOB (900657)
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. J.H.P. Houdijk
Docent(en)	dr. J.H.P. Houdijk, prof. dr. T.W.J. Janssen
Lesmethode(n)	Hoorcollege, Practicum
Niveau	500

Doel vak

The student is capable to:

- understand the relevant issues, terms, concepts, and models in the restoration of mobility within the context of rehabilitation,
- understand and knowledge of the practical aspects of patient-related – biophysical - research into restoration of mobility in rehabilitation,
- Develop knowledge, understanding and skills in (clinical) human movement research results, methods and techniques of measurement of 'function & structure, activity, participation and functionality,
- Appreciate and understand various aspects of adaptation, compensation, training and learning of function and activities in the framework of

restoration of mobility in persons with lower limb impairments,
• understand the contexts, and the practical process of scientific research and communication in the combined fields of rehabilitation and human movement sciences.

Inhoud vak

Being the key-issue in rehabilitation, this course concentrates on the 'restoration of mobility' – and its underlying mechanisms - at the different levels of the International Classification of Functioning, Disability and Health (WHO 2001). Primarily a biophysical approach is taken: biomechanical and exercise physiological principles, techniques and research findings will be discussed in specific patient-related experiments and studies. Aspects of adaptation, compensation as well as concepts of learning and training mechanisms will be addressed. Research in this field will be presented and discussed in the format of 'Capita Selecta'.

Onderwijsvorm

Brief description of Lectures ('hoorcolleges'): 6 lectures in which the current issues and state-of-the-art research different patientpopulations is discussed.

Practicals: two visits to rehabilitation centers(Reade Amsterdam, Heliomare Wijk aan Zee)

Assessment: a written assignment (16 hours), a written examination (41 hours self study and 3 hours examination).

Toetsvorm

Specific description of the assessment form, such as:

- written test: written examination covering lectures and reading material; short essay questions. (80%)
- assignment(s): essay on restoration of mobility conform format popular scientific magazine. (20%).

Literatuur

A selection of scientific papers.

Vereiste voorkennis

None.

Research Internship

Vakcode	B_RI (900624)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Niveau	600

Doel vak

During the research internship, students conduct scientific research in a 'master - pupil relationship'. The research must meet the following qualifications:

- The research is aimed at a suitably challenging research question;
- The research is conducted in a methodologically correct way;
- The research is related to and is based on the theory that applies to planned research.

The teaching focus of the internship is on gaining insight in to the connection between the components of the research process, namely formulating a research question, creating a hypothesis, planning and conducting experiments, processing data, interpretation of the results and reporting. It should be kept in mind that 'experiments' should not be interpreted too narrowly: these can also be field measurements, or epidemiological research.

Onderwijsvorm

The student pair or student conducts the research internship under the guidance of a faculty staff member. The internship is often part of a larger project. The subject of the internship is chosen in consultation with a staff member and/or the coordinator. It is also possible for a student to choose one's own subject, in consultation with the coordinator. Proposals for an internship from staff members and external partners can usually be found on Blackboard ('Research Internship'), although it might be worthwhile contacting the Research Group Leaders (PI) of research institute MOVE for information on the latest possibilities. The Research School MOVE website (www.move.vu.nl) is an appropriate orientation on the Research Internship. In consultation with the coordinator, a student may conduct the research internship outside the faculty or abroad. Especially for foreign projects, additional requirements related to courses followed and obtained grades might apply. Above all, an internship abroad requires an early start to have sufficient time for the much more complex organization of the internship (at least 1 year before the start of the internship). Once the subject and the internship supervisor(s) have been established, the student writes a work plan for the research internship, comprising research question, hypothesis(es), methods statistics and planning. Beyond time schedule, the latter should include choices for equipment and indications for organization of the work. If the work plan is approved by the internship supervisors, it has to be presented during a work group meeting of the specialization to which the students belong, or, if applicable, a meeting of the specialization in which the work is best suited. Reporting takes place in the form of an English language formal paper, or research report (depending on the internship). Research results also have to be presented at a work group meeting at the end of the process. Every student has a right to consultation and supervision during the research internship. The available time for supervision depends on the size of the internship and is in the order of 30 hrs for an individual 24 ECTS internship (and for a pair 60 hrs).

Toetsvorm

The evaluation of the research internship consists of three elements, namely:

- the performance of the experiments and specifically the data collection and processing;
- the report;
- the oral presentation of the report during the work group meeting.

The performance of the experiments is judged by the internship supervisor(s), the report and the oral presentation are judged by both the internship supervisor(s) and a second assessor. The performance of experiments makes up 40% of the mark, the report makes up 50% and the oral presentation makes up the final 10%.

Literatuur

Course Manual 'Research Internship', available on Blackboard.

Overige informatie

The final version of the report has to be submitted to the Research Internship Blackboard site for a plagiarism check before the mark can be registered by the student administration office. In case the electronic check should lead to a formal check, the administration of the final mark may be postponed until a final assessment by the Examination Commission had been made.

Short Literature Review

Vakcode	B_SLR (900601)
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Niveau	600

Doel vak

The aim of the Short Literature Review is to determine whether a student can formulate a research question and an objective answer to this question related to Human Movement Sciences based on peer-reviewed literature and is subsequently able to express these findings in a written report. Secondly, the Short Literature Review will serve as an evaluation of the student's skills in scientific writing. The Short Literature Review is an individual product.

Inhoud vak

The student chooses a subject related to Human Movement Sciences on which to write the Short Literature Review. The subject of the Short Literature Review should not be related to the subject of the Research Internship.

Onderwijsvorm

The student formulates a question related to Human Movement Sciences, which should be approved by a staff member of the department. In fore coming cases, the coordinator may allocate a supervisor, usually on the basis of the chosen subject and availability. At the start of the writing process, the student draws up a plan. This plan must contain a detailed presentation of the question for the Short Literature Review, a literature search strategy and a temporary classification (i. e. chapters or paragraphs). The student collects and selects relevant literature for the Short Literature Review and writes a report on the chosen subject. Regular consultation with the supervisor is recommended. The student is entitled to 12 hours of supervision. The completed Short Literature Review may be presented during a research meeting of one of the specializations.

Toetsvorm

If the student or supervisor feels that this is necessary a second opinion can be asked for.

Literatuur

Course manual Short Literature Review (available on Blackboard).

Overige informatie

The final version of the Short Literature Review has to be uploaded to the relevant Blackboard site for a plagiarism check. The electronic evaluation form has to be filled in before the mark can be registered by the study secretariat.

Sport and Society

Vakcode	B_SPORTSOC (900665)
Periode	Periode 1
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. I.M. van Hilvoorde
Docent(en)	dr. I.M. van Hilvoorde
Lesmethode(n)	Hoorcollege, Werkcollege
Niveau	500

Doel vak

The student:

- is able to understand and conceptualize sport as a social phenomenon
- has understanding and knowledge of the main sport sociological issues and controversies
- is able to translate these issues and understands its consequences for sports policy.
- is able to understand and apply theories that conceptualize the relations between technology and sport
- is trained in critical reading and evaluation of papers from a conceptual and sport sociological perspective

Inhoud vak

Students get acquainted with general theories about sports and society, and are able to apply these theories on the following key issues:

- The organization and evolution of sport
- Connections between sport and other spheres of social life (cf. education, public health)
- Connections and interdependencies between sport and globalization, commercialization, technology and the media
- Relations between sport success, heroism and national pride
- The question if sports and politics can and/or should be kept separate
- The way in which elite sport enforces cultural ideologies concerning human bodies and deviance (in particular in relation to human enhancement, doping or the boundary between “able bodies” and “disabled bodies”).

Onderwijsvorm

Amount of contact hours:

Lectures: 12 hours

Tutorials: 10 hours

Assessment: paper

Combination of Lectures and Tutorials

Toetsvorm

- paper/reviews

Literatuur

- Selection of relevant articles, lecture notes.

Vereiste voorkennis

Recommended background knowledge: Philosophy of sport.

Statistics for Experimental Research

Vakcode	B_STATEXPRES (900683)
Periode	Periode 4
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	dr. M.J.M. Hoozemans
Examinator	dr. M.J.M. Hoozemans
Docent(en)	dr. M.J.M. Hoozemans
Lesmethode(n)	Hoorcollege, Werkcollege, Computerpracticum
Niveau	400

Doel vak

On the basis of case descriptions and raw data the student is capable to:

- determine the research designs and choose, justify and perform the appropriate statistical analyses (t-tests or ANOVAs or their non-parametric counterparts) using SPSS.
- report the analyses and the results in the same way as is commonly done in methods and results sections of scientific journal articles.

Inhoud vak

Students will learn ins and outs of applying and interpreting statistical techniques that are common or are becoming common in experimental research. The topics covered in this course are:

- Research design
- Basic statistical principles (e.g. data exploration)
- Estimating a population mean from a sample
- Independent and paired t-tests and their associated confidence intervals
- Non-parametric difference tests
- Linear regression
- One-way ANOVA (between subjects and repeated measures)
- Factorial ANOVA (two-way between subjects, two-way repeated measures, two-way mixed design)
- Effect size
- Data transformations

There will be lectures and SPSS practical sessions for all the topics covered in the course.

Onderwijsvorm

Lectures (20 hours / 10 lectures)

Computer practicals (32 hours / 8 practicals)

Toetsvorm

The students have to take an examination. It will focus on t-tests, non-parametric difference tests, one-way ANOVA and factorial ANOVA.

Literatuur

Andy Field – Discovering Statistics using SPSS

Studentbegeleiding

Vakcode	B_STDBEG ()
Periode	Ac. Jaar (september)
Credits	6.0
Voertaal	Nederlands
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	drs. M.G.J. Buijtenweg

Talent Identification and Development

Vakcode	B_TALDEVEL (900672)
Periode	Periode 3
Credits	3.0
Voertaal	Engels
Faculteit	Faculteit der Bewegingswetenschappen
Coördinator	prof. dr. G.J.P. Savelsbergh
Docent(en)	prof. dr. G.J.P. Savelsbergh
Lesmethode(n)	Hoorcollege
Niveau	400

Doel vak

Students are able to summarize and examine the implications of adopting a multi- disciplinary research perspective for the comprehensive study of talent development and identification, and identify and elaborate upon the limitations of existing (mono- disciplinary) research on talent identification and development (expert performance). Additionally, students are able to make recommendations for future research on understanding talent development and for implementing talent developmental programs.

Inhoud vak

In recent years, research on expertise and the identification and development of talent has tended to be mono- disciplinary. In the current course a multi- disciplinary approach is emphasized. The lectures discuss the environmental influences, but also deal with genetic issues and the interplay between the two from the various disciplines within human movements sciences among others, philosophy, psychology and physiology. The course addresses several issues, that

all seem to play a part in talent identification and development. Like the amount of deliberate practice, the use of visual information, cognitive abilities, genetic make up or constraints, anthropometric characteristics, muscle structure and amount of fast and slow twitch muscle.

Onderwijsvorm

lecture

Six lectures provide the student with an introduction into the contemporary approaches to talent identification and development.

Toetsvorm

The course is concluded with a written test consisting of open- end questions.

Literatuur

A collection of recent theoretical and experimental papers from the scientific literature (details to be announced)

Vereiste voorkennis

None

Teacher Training at the Upper Secondary Level

Vakcode	B_DOCENTHBO (900630)
Periode	Ac. Jaar (september)
Credits	24.0
Voertaal	Nederlands
Faculteit	Faculteit der Bewegingswetenschappen
Lesmethode(n)	Werkcollege

Doel vak

Binnen de verschillende accenten bestaat voor de student de mogelijkheid zich te profileren in de richting van het beroep docent. Hiertoe dient de docentenopleiding gevolgd te worden. Reeds vele afgestudeerden zijn werkzaam als docent in het hoger beroepsonderwijs (hbo), onder meer aan de opleidingen Fysiotherapie en Lichamelijke opvoeding. Daar geven zij, afhankelijk van de richting, theorie- en vaardigheidslessen in vakken als anatomie, (inspannings)fysiologie, (sport)psychologie, gezondheidskunde, methodologie en bewegingsanalyse, begeleiden zij tutorgroepen en/of afstudeerstages en zijn zij actief betrokken bij onderwijsontwikkeling.

Het doel van de docentenopleiding is dat de studenten de competenties van een beginnende docent verwerven. Zodat zij over kennis, inzicht, vaardigheden en attitudes beschikken die hen in staat stellen als docent te functioneren en hun taken en taakuitvoering kritisch te evalueren en te veranderen.

Inhoud vak

Het opleidingsprogramma bestaat uit de volgende onderdelen: vier didactische cursussen, een professionaliseringstraject, een onderwijsinnovatieproject en een stage. De didactische cursussen zijn erop gericht de studenten kennis, inzichten, vaardigheden en attitudes te verschaffen die nodig zijn voor het voorbereiden, uitvoeren en evalueren van onderwijs. Hierbij gaat het voornamelijk om het voorbereiden, verantwoorden en verzorgen van lessen (hoorcolleges,

doceerlessen, werkgroepbegeleiding en vaardigheidslessen), het begeleiden van individuele studenten en het ontwikkelen en afnemen van toetsen. Het professionaliseringstraject biedt ondersteuning bij je ontwikkeling tot hbo-docent. Voor het onderwijsinnovatieproject voeren studenten in een projectgroep een opdracht van een hbo-instelling gericht op een onderwijsvernieuwing uit. De stage verschaft de studenten kennis en inzicht in de onderwijs- en lesgeefpraktijk op een hbo-opleiding alsmede vaardigheid in het geven van onderwijs. De stage is het onderdeel van de docentenopleiding waarin integratie van de theorie in de praktijk plaatsvindt: vrijwel alle cursussen lopen vooruit op of grijpen terug naar activiteiten die studenten in de stage ondernemen. De stage loopt van september tot en met april. In overleg met de stage-instelling maakt de student een rooster waarin hij aangeeft wanneer hij (gemiddeld 1 dag in de week) op de instelling aanwezig is. Tijdens de stage dienen zowel lessen geobserveerd als gedoceerd te worden. Minimaal één les staat onder supervisie van de docentenopleiding en één les wordt vakinhoudelijk beoordeeld door een vakinhoudelijk deskundige docent. Daarnaast wordt onder begeleiding van de stage-instelling en de docentenopleiding, in de stage gewerkt aan een aantal opdrachten. Overzicht van de studieonderdelen:

- didactische basisprincipes
- onderwijs aan groepen
- toetsen en beoordelen
- studentbegeleiding
- professionaliseringstraject
- onderwijsinnovatieproject
- stage

Onderwijsvorm

Binnen de didactische cursussen vindt thuis kennisoriëntatie plaats aan de hand van opdrachten. Tijdens de bijeenkomsten staat veelal de praktische toepassing centraal en werken de studenten aan de hand van oefeningen/opdrachten veel met elkaar samen in subgroepjes. Deze werkwijze maakt het noodzakelijk dat de studenten elke bijeenkomst bijwonen en actief participeren; aanwezigheid is verplicht.

Toetsvorm

Om de docentenopleiding af te ronden dient de student aan de hand van een beoordelingsportfolio en een beoordelingsgesprek te bewijzen de docentcompetenties op het niveau van een beginnend docent te bezitten. Hiertoe zal de student voldoende bewijslast moeten verzamelen. Kenmerkend voor deze toetsvorm is dat de verantwoordelijkheid meer bij de student komt te liggen, aangezien deze deels zelf bepaalt hoe en waarmee hij de verschillende competenties onderbouwt. Een aantal bewijsstukken is voorwaarde om de docentenopleiding af te ronden.

Literatuur

De boeken en de handleidingen worden verkocht tijdens de bijeenkomsten. De kosten bedragen ongeveer EUR 225,- en dienen voor het eind van de reguliere cursusduur betaald te worden.

Overige informatie

Het ministerie van OC&W heeft in de jaren 90 regelingen opgesteld inzake de benoembaarheidseisen voor docenten hbo. Een hbo-docent dient naast het bezit van een bewijs/verklaring van bekwaamheid (een getuigschrift van met goed gevolg afgelegd afsluitend examen Bewegingswetenschappen) ook in het bezit te zijn van een bewijs/verklaring van voldoende didactische voorbereiding. De benodigde didactische vaardigheden dient de docent op sommige hogescholen zich eigen te maken door het volgen van een

didactische scholing (hbo-didactische cursus) nadat hij is aangesteld als docent binnen het hbo. Studenten die de docentenopleiding FBW met succes hebben afgerond wordt vrijstelling verleend voor de hbo-didactische cursus, mits zij niet langer dan vijf jaar na het afronden van de docentenopleiding met de hbo-didactische cursus beginnen. Geïnteresseerden die hun Master of Doctoraal reeds behaald hebben en niet meer ingeschreven staan als student kunnen indien er plaats is aan de opleiding deelnemen als contractstudent. De kosten hiervoor worden geschat op € 2780,- te voldoen aan het begin van de opleiding. De docentenopleiding start in september en wordt afgesloten in mei. De vaste lesdag op de VU is de vrijdag.

Afhankelijk van de beschikbaarheid van externe stageplaatsen en de begeleidingsmogelijkheden is er een flexibele bovengrens in toelatingsplaatsen. Bij meer aanmeldingen dan plaatsen kan de docentenopleiding besluiten een toelatingsassessment te laten plaatsvinden.

Aanmelding dient schriftelijk te gebeuren vóór 1 mei op een daarvoor bestemd formulier. Voor een volledige beschrijving van het opleidingsprogramma wordt verwezen naar het leerplan. Dit leerplan en het aanmeldingsformulier zijn te vinden op <http://www.exposz.nl/sport/docentenopleiding-fbw/>