Competence coverage matrix

GHENT UNIVERSITY

Master of Science in Biomedical Engineering

Academic year 2021-2022

Legend:
T=teaching methods
E=evaluation methods

			General Courses														Master's Dissertation
			E010371 Medical Imaging	E003280 Clinical Study Design and Biostatistics	E092814 Hospital Project	E015590 Leadership in Health Care	E015570 Health Information and Decision Support Systems	E063671 Biomaterials and Tissue Engineering	E010382 Neuro-engineering Science	E010600 Micro- and Nanotechnologies for Medical Device Design and Fabrication	E074123 Artificial Organs	E092802 Biomedical Product Development	E092682 Medical Equipment, Safety and Regulations	E027770 Data Analytics in Healthcare and Connected Care	E010610 Biomedical Robotics and Assistive Technologies	E091103 Master's Dissertation
Competences in one/more scientific discipline(s)	Master and apply advanced knowledge in the own engineering discipline in solving complex problems.	T 6 E 6			T E	T E	T E			T E					T E	T E
	Apply Computer Aided Engineering (CAE) tools and advanced communication instruments in a creative and purposeful way.	T 1													T	
	Be familiar with and have an understanding of the basic concepts and principles in the field of anatomy, (cell- and molecular) biology, chemistry, physiology, biomechanics and medical and health sciences.	T 2 E 2							T E	T E						
	Be familiar with and have an understanding of standard methods for the quantitative measurement of structures and functioning of biological systems on molecular, organic and system- level.	T 1 E 1											T E			
	Be familiar with the functioning of medical devices and have insight in the relations between the results of measurements and the observed or controlled biophysical parameters.	T 4 E 4									T E	T E	T E		T E	
	Be familiar with and have an understanding of state-of-the-art methods for data analysis and the principles of artificial intelligence in data processing and medical decision support systems.	T 4 E 4		T E			T E		T E					T E		
	Have a fundamental insight in the physical principles, technological possibilities and limitations of medical signal and imaging modalities.	T 3 E 3	T E						T E						T E	
	Have a good understanding of the physical and chemical properties of body tissues, supplementary or substituting (synthetic) biomedical materials and their interactions.	T 4 E 3								T E	T E		T E		T	
	Be able to apply algorithms for the assessment and optimization of radiation doses based on a profound insight into the absorption of the dosage and the functioning of radiation-generating and detecting machinery.															
	Be able to estimate the consequences of the interaction between radiation and living tissues and biomedical materials.	T 1											T			
Scientific competences	Analyse complex problems and translate them into concrete research questions.	T 8 E 8	T E	T E	T E			T E		T E				T E	T E	T E
	Consult the scientific literature as part of the own research.	T 5 E 4	T	T E				T E							T E	T E
	Select and apply the appropriate models, methods and techniques.	T 10 E 10	T E	T E	T E		T E	T E	T E	T E				T E	T E	T E
	Develop and validate mathematical models and methods.	T 3 E 3	T E				T E								T E	
	Interpret research findings in an objective and critical manner.	T 6 E 5		T E						T	T E	T E			T E	T E
	Analyse complex multidisciplinary biomedical problems based on (recent) scientific research and transform them into a logically structured, technologically realisable and ethically justifiable research plan.	T 2 E 2			T E											T E
	Answer a concrete and relevant biomedical engineering question on a basis of recent technical, scientific and medical knowledge.	T 9 E 9			T E	T E			T E	T E	T E		T E	T E	T E	T E
	Apply complex concepts, techniques and methods in order to solve real problems in physiology and clinical medicine.	T 8 E 7	T E		T E		T E		T E	T E	T E				T	T E
	Critically and permanently evaluate the quality, (bio-)ethical aspects, innovative value and (bio-)safety of (own) research.	T 4 E 4			T E					T E					T E	T E
	Process, evaluate, interpret and summarize results of (own) research in a systematic, critical and clear way.	T 4 E 4			T E					T E					T E	T E
Intellectual competences	Independently form an opinion on complex situations and problems, and defend this point of view.	T 6 E 6		T E		T E			T E	T E					T E	T E
	Apply knowledge in a creative, purposeful and innovative way to research, conceptual design and production.	T 4 E 3			T E							T E			T	T E
	Critically reflect on one's own way of thinking and acting, and understand the limits of one's competences.	T 3 E 3				T E									T E	T E
	Stay uptodate with the evolutions in the discipline to elevate the own competences to expert level.	T 6 E 4			T E	T E					T E		T		T	T E
	Readily adapt to changing professional circumstances.	T 3 E 2			T E								T			T E
Competences in cooperation and communication	Have the ability to communicate in English about the own field of specialisation.	T 11 E 11	T E	T E	T E	T E			T E	T E	T E	T E	T E		T E	T E
	Project management: have the ability to formulate objectives, report efficiently, keep track of targets, follow the progress of the project,...	T 7 E 7		T E	T E	T E				T E		T E			T E	T E
	Have the ability to work as a member of a team in a multi disciplinary workingenvironment, as well as being capable of taking on supervisory responsibilities.	T 3 E 3			T E	T E						T E				
	Report on technical or scientific subjects verbally, in writing and using graphics.	T 8 E 8	T E	T E	T E	T E	T E			T E					T E	T E
	Critically discuss a research plan with fellows, doctors and researchers working in disciplines related to biomedical sciences and health care.	T 5 E 5		T E	T E	T E						T E				T E
	Communicate (own) results orally and in writing in a systematic and clear way to various levels.	T 4 E 4			T E	T E									T E	T E

Competence coverage matrix

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Master of Science in Biomedical Engineering

Academic year 2021-2022

Legend:
T=teaching methods
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			E010371 Medical Imaging	E003280 Clinical Study Design and Biostatistics	E092814 Hospital Project	E015590 Leadership in Health Care	E015570 Health Information and Decision Support Systems	E063671 Biomaterials and Tissue Engineering	E010382 Neuro-engineering Science	E010600 Micro- and Nanotechnologies for Medical Device Design and Fabrication	E074123 Artificial Organs	E092802 Biomedical Product Development	E092682 Medical Equipment, Safety and Regulations	E027770 Data Analytics in Healthcare and Connected Care	E010610 Biomedical Robotics and Assistive Technologies	E091103 Master's Dissertation
Societal competences	Act in an ethical, professional and social way.	T 7 E 6		T E	T E	T	T E			T E					T E	T E
	Recognize the most important business and legal aspects of the own engineering discipline.	T 4 E 3		T E		T E	T E								T	
	Understand the historical evolution of the own engineering discipline and its social relevance.	T 5 E 4					T E				T E		T E		T	T E
	Take up a well-founded position about socio-economic and societal aspects of biomedical engineering.	T 4 E 4		T E		T E					T E				T E	
	Take into consideration the medical ethics and laws and rules with respect to the implementation of medical-technical actions and scientific research in a clinical environment.	T 4 E 3		T E			T E			T E					T	
	Show a strong international awareness and be open for new societal questions, evolutions, needs and demands for innovation.	T 2 E 2				T E					T E					
	Be aware of ethical and safety aspects in biomedical practice.	T 8 E 7	T E		T E	T E	T E			T E	T E				T	T E
	Strive for a continuous improvement and guarantee of health care and quality of life of the individual and society.	T 7 E 5		T E	T E	T E					T E		T		T	T E
Profession-specific competence	Master the complexity of technical systems by using system and process models.	T 2 E 2													T E	T E
	Reconcile conflicting specifications and prior conditions in a high quality and innovative concept or process.	T 5 E 3			T E						T			T E	T	T E
	Synthesize incomplete, contradictory or redundant data into useful information.	T 4 E 4			T E							T E		T E		T E
	Possess sufficient ready knowledge and understanding to evaluate the results of complex calculations, or make approximate estimates.	T 4 E 3			T E									T E	T	T E
	Pay attention to entire life cycles of systems, machines, and processes.	T 3 E 1			T E								T		T	
	Pay attention to sustainability, energyefficiency, environmental cost, use of raw materials and labour costs.	T 3 E 3			T E						T E	T E				
	Pay attention to all aspects of reliability, safety, and ergonomics.	T 5 E 3			T E					T E	T E		T		T	
	Have insight into and understanding of the importance of entrepreneurship.	T 2 E 1				T E									T	
	Show perseverance, innovativeness, and an aptitude for creating added value.	T 4 E 4			T E							T E			T E	T E
	Have sufficient knowledge and understanding to develop and technically evaluate new materials, equipment, tools, systems and methods for prognosis, (early) diagnosis, prevention and treatment of illness and for convalescence.	T 6 E 5		T E						T E	T E		T E		T	T E
	Mathematically translate complex biomechanical, biological and physiological processes under normal and pathological conditions into advanced models and paradigms, knowing their limitations and finding creative solutions for these limitations.	T 1													T	
	Apply the most suitable instruments, concepts, techniques and methods for the solution of real problems in physiology and clinical medicine on molecular, organic and system level.	T 2 E 1													T	T E
	Target-oriented implementation of algorithms for the extraction of clinically relevant information from biomedical signals or images, including the most suitable method for the reduction of measurement artefacts (baseline drift, noise, interferences, mistakes in the models,...).	T 4 E 3	T E	T E			T E								T	
	Be aware of the importance of maintenance, quality control, safety and risk management and regulations for the specific application level.	T 5 E 3		T E	T E					T E			T		T	
	Correctly assess the role and possibilities of data-processing systems in a local (hospital) and regional environment while being aware of potential problems associated with the implementation of such systems.	T 4 E 4		T E	T E	T E	T E									
	Specify the physical and technical-chemical properties of synthetic materials for a wide range of biomedical applications and implement adequate tests.	T 2 E 2						T E			T E					
Expert in Medical Radiation Physics	Introduce measures and procedures in hospitals to ensure the safety and protection of radiation of persons (primarily patients) exposed to radiation for medical purposes.															
	Accept radiation-generating medical devices and products as well as radiation-detecting equipment prior to their first use.															
	Elaborate, implement and follow-up of quality control procedures.															
	Perform device-specific dosimetry.															
	Provide assistance, in collaboration with the medical staff, to patient-specific dosimetry and projects on optimisation of doses.															
	Provide professional advice for the preparation of specifications for the purchase of radiation-generating and -detecting devices and products.															

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Expert in Medical Radiation Physics	Adequately choose, accept and calibrate instruments and devices for dosimetry and measurement of radiation activity.	W 10 E 9	W 19 E 19	W 29 E 29	W 19 E 18	W 13 E 13	W 4 E 4	W 8 E 8	W 20 E 19	W 17 E 16	W 10 E 10	W 14 E 7	W 7 E 7	W 41 E 21	W 31 E 31

<< **EMingwALG1.1 Master and apply advanced knowledge in the own engineering discipline in solving complex problems.** *Competences in one/more scientific discipline(s)*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	report	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E015570 Health Information and Decision Support Systems	practicum	oral examination	Insight in the development of clinical decision support and computer-aided diagnosis systems.
E010600 Micro- and Nanotechnologies for Medical Device Design and Fabrication	demonstration online project online lecture: plenary exercises online lecture online group work online demonstration lecture: plenary exercises self-reliant study activities project online discussion group lecture	oral examination report	Design skills of the embedded system aspects. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding the design constraints of the electronic and peripheral components of implantable devices. Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems. System integration, sterilization and packaging aspects of biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems. Understanding of the contamination control in cleanroom environments.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture	oral examination report	Understanding of the difficulties and challenges of human-robot interaction. The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

<< **EMingwALG1.2 Apply Computer Aided Engineering (CAE) tools and advanced communication instruments in a creative and purposeful way.** *Competences in one/more scientific discipline(s)*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010610 Biomedical Robotics and Assistive Technologies	seminar: coached exercises		The ability to create a basic robotic control loop.

<< **EMingwBIOM1.1 Be familiar with and have an understanding of the basic concepts and principles in the field of anatomy, (cell- and molecular) biology, chemistry, physiology, biomechanics and medical and health sciences.** *Competences in one/more scientific discipline(s)*

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E010382	Neuro-engineering Science	lecture	written examination with open questions	Have insight in the working principles of the brain and a basic knowledge of most common neurological disorders.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online lecture: plenary exercises online lecture lecture: plenary exercises	oral examination	System integration, sterilization and packaging aspects of biomedical devices and systems. Understanding the design constraints of the electronic and peripheral components of implantable devices.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092682 Medical Equipment, Safety and Regulations	demonstration lecture	written examination with open questions written examination with multiple choice questions	The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.

<< **EMingwBIOM1.3 Be familiar with the functioning of medical devices and have insight in the relations between the results of measurements and the observed or controlled biophysical parameters.** *Competences in one/more scientific discipline(s)*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092802 Biomedical Product Development	project	participation report	Being capable of presenting and defending a project.
E092682 Medical Equipment, Safety and Regulations	demonstration lecture	written examination with open questions written examination with multiple choice questions	The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture	oral examination report	Understanding of how a robot is controlled. Understanding of the difficulties and challenges of human-robot interaction.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination report open book examination	Critically approaching commonly used statistical methods in medicine and biomedical research
E015570	Health Information and Decision Support Systems	lecture seminar practicum	report	Knowledge of current systems for clinical decision support and computer-aided diagnosis, including expert-based, data driven and intelligent systems. Knowledge of the basics in statistics, information theory, and machine learning for clinical decision support.
E010382	Neuro-engineering Science	seminar: practical PC room classes	report	Have an insight in the background, methods and interpretation of the different techniques to measure brain activity and signals.
E027770	Data Analytics in Healthcare and Connected Care	lecture practicum	written examination report skills test	Being able to select, for a given healthcare analytics problem, the most appropriate method to achieve the defined goals Understanding the details of and choice between supervised and unsupervised systems Being familiar with the basic concepts of database systems and databases and understanding how database systems work Having a comprehensive knowledge of Python for data analytics purposes Being able to construct datasets by querying APIs Having a comprehensive knowledge about the machine learning process where data is transformed into information and knowledge Interpreting and visualizing the results of a machine learning process or the content of medical datasets

<< **EMingwBIOM1.4 Have a fundamental insight in the physical principles, technological possibilities and limitations of medical signal and imaging modalities.** *Competences in one/more scientific discipline(s)*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010371 Medical Imaging	lecture seminar: practical PC room classes	oral examination report	Understand physical principles of different medical imaging techniques Understand relationship between different image processing techniques Be able to explain the basic principles of the most important techniques in image enhancement, image segmentation and image registration. Be able to judge the advantages and disadvantages of different medical imaging techniques. Have insight in advantages and disadvantages of existing image reconstruction techniques Be capable of defining components of medical imaging systems
E010382 Neuro-engineering Science	lecture	written examination with open questions	Have an insight in the background, methods and interpretation of the different techniques to measure brain activity and signals.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities	oral examination	Understanding of the difficulties and challenges of human-robot interaction.

<< **EMingwBIOM1.5 Have a good understanding of the physical and chemical properties of body tissues, supplementary or substituting (synthetic) biomedical materials and their interactions.** *Competences in one/more scientific discipline(s)*

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online project online lecture: plenary exercises online lecture lecture: plenary exercises project	oral examination report	Skills to decide on the powering and the telemetry aspects of biomedical devices and systems. Understanding the design constraints of the electronic and peripheral components of implantable devices. System integration, sterilization and packaging aspects of biomedical devices and systems.
E074123	Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092682	Medical Equipment, Safety and Regulations	demonstration lecture	written examination with open questions written examination with multiple choice questions	The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610	Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities lecture		Understanding of the difficulties and challenges of human-robot interaction.

<< **EMingwBIOM1.6 Be able to apply algorithms for the assessment and optimization of radiation doses based on a profound insight into the absorption of the dosage and the functioning of radiation-generating and detecting machinery.** *Competences in one/more scientific discipline(s)*

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*

<< **EMingwBIOM1.7 Be able to estimate the consequences of the interaction between radiation and living tissues and biomedical materials.** *Competences in one/more scientific discipline(s)*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092682 Medical Equipment, Safety and Regulations	demonstration lecture		The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010371 Medical Imaging	lecture seminar: practical PC room classes	report	Understand physical principles of different medical imaging techniques Understand relationship between different image processing techniques Be able to explain the basic principles of the most important techniques in image enhancement, image segmentation and image registration. Be able to judge the advantages and disadvantages of different medical imaging techniques. Have insight in advantages and disadvantages of existing image reconstruction techniques
E003280 Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination report open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Critically approaching commonly used statistical methods in medicine and biomedical research Understanding the specific considerations in clinical study design for medical devices
E092814 Hospital Project	project	report	In vivo experience with medical technology
E063671 Biomaterials and Tissue Engineering	group work lecture	written examination participation	Insights in the potential and limitations of the various biomaterials. Knowledge on methods for in vitro characterization of biomaterials. Knowledge on the newer developments and forming methods of the various biomaterials. Knowledge on the various biomaterials and their applied combinations in the medical sector. Knowledge on how biomaterials are developed and improved.
E010600 Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online project online lecture: plenary exercises online lecture online group work lecture: plenary exercises self-reliant study activities project online discussion group	oral examination report	Design skills of the embedded system aspects. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding the design constraints of the electronic and peripheral components of implantable devices. Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems.
E027770 Data Analytics in Healthcare and Connected Care	lecture	written examination	Being able to select, for a given healthcare analytics problem, the most appropriate method to achieve the defined goals Understanding the details of and choice between supervised and unsupervised systems Being familiar with the basic concepts of database systems and databases and understanding how database systems work Understand network technologies and protocols tailored to connect medical devices, wearables and databases Having a comprehensive knowledge about the machine learning process where data is transformed into information and knowledge
E010610 Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities	oral examination	The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010371 Medical Imaging	lecture		Be able to judge the advantages and disadvantages of different medical imaging techniques.
E003280 Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	report	Critically approaching commonly used statistical methods in medicine and biomedical research
E063671 Biomaterials and Tissue Engineering	lecture	written examination	Insights in the potential and limitations of the various biomaterials. Knowledge on methods for in vitro characterization of biomaterials. Knowledge on the newer developments and forming methods of the various biomaterials. Knowledge on the various biomaterials and their applied combinations in the medical sector. Knowledge on how biomaterials are developed and improved.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities	oral examination	The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E010371	Medical Imaging	lecture	oral examination	Be capable of defining components of medical imaging systems
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination report open book examination	Critically approaching commonly used statistical methods in medicine and biomedical research
E092814	Hospital Project	project	peer assessment	In vivo experience with medical technology
E015570	Health Information and Decision Support Systems	lecture practicum	oral examination report	Insight in the development of clinical decision support and computer-aided diagnosis systems.
E063671	Biomaterials and Tissue Engineering	group work practicum lecture	written examination participation	Insights in the potential and limitations of the various biomaterials. Knowledge on methods for in vitro characterization of biomaterials. Knowledge on the newer developments and forming methods of the various biomaterials. Knowledge on the various biomaterials and their applied combinations in the medical sector. Knowledge on how biomaterials are developed and improved.
E010382	Neuro-engineering Science	seminar: practical PC room classes	report	Have an insight in the background, methods and interpretation of the different techniques to measure brain activity and signals.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online project online lecture: plenary exercises online lecture lecture: plenary exercises self-reliant study activities project online discussion group	oral examination report	Design skills of the embedded system aspects. Understanding the design constraints of the electronic and peripheral components of implantable devices. System integration, sterilization and packaging aspects of biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems.
E027770	Data Analytics in Healthcare and Connected Care	lecture	written examination	Being able to select, for a given healthcare analytics problem, the most appropriate method to achieve the defined goals Understanding the details of and choice between supervised and unsupervised systems
E010610	Biomedical Robotics and Assistive Technologies	seminar: coached exercises	oral examination	The ability to create a basic robotic control loop.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E010371	Medical Imaging	lecture	oral examination	Understand relationship between different image processing techniques
E015570	Health Information and Decision Support Systems	practicum	oral examination	Insight in the development of clinical decision support and computer-aided diagnosis systems.
E010610	Biomedical Robotics and Assistive Technologies	seminar: coached exercises	oral examination	The ability to create a basic robotic control loop.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination report open book examination	Critically approaching commonly used statistical methods in medicine and biomedical research
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture project		knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E074123	Artificial Organs	lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092802	Biomedical Product Development	project	participation report	Being capable of presenting and defending a project.
E010610	Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities	oral examination report	Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment report	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E092814	Hospital Project	project	peer assessment report	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E015590	Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E010382	Neuro-engineering Science	lecture	written examination with open questions	Understand the different neuromodulation techniques and how these are used to study the function of specific brain structures and to influence regions in neurological disorders.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online project online lecture: plenary exercises online lecture online group work lecture: plenary exercises self-reliant study activities project online discussion group	oral examination report	Design skills of the embedded system aspects. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding the design constraints of the electronic and peripheral components of implantable devices. Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems. System integration, sterilization and packaging aspects of biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems.
E074123	Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092682	Medical Equipment, Safety and Regulations	demonstration lecture	written examination with open questions written examination with multiple choice questions	The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E027770	Data Analytics in Healthcare and Connected Care	lecture	written examination	Being able to select, for a given healthcare analytics problem, the most appropriate method to achieve the defined goals Understanding the details of and choice between supervised and unsupervised systems
E010610	Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities	oral examination report	The ability to create a basic robotic control loop.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E010371	Medical Imaging	lecture	oral examination	Have insight in advantages and disadvantages of existing image reconstruction techniques
E092814	Hospital Project	project	peer assessment report	In vivo experience with medical technology
E015570	Health Information and Decision Support Systems	practicum	oral examination report	Insight in the development of clinical decision support and computer-aided diagnosis systems.
E010382	Neuro-engineering Science	lecture	written examination with open questions	Have an insight in the background, methods and interpretation of the different techniques to measure brain activity and signals.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online project online lecture: plenary exercises online lecture online group work lecture: plenary exercises self-reliant study activities project online discussion group	oral examination report	Design skills of the embedded system aspects. Understanding the design constraints of the electronic and peripheral components of implantable devices. Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems. System integration, sterilization and packaging aspects of biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems.
E074123	Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E010610	Biomedical Robotics and Assistive Technologies	seminar: coached exercises		The ability to create a basic robotic control loop.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E092814	Hospital Project	project	peer assessment	In vivo experience with medical technology
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online project online lecture online group work project online discussion group	oral examination report	Understanding the design constraints of the electronic and peripheral components of implantable devices. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E010610	Biomedical Robotics and Assistive Technologies	self-reliant study activities	oral examination	Understanding of the difficulties and challenges of human-robot interaction.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E092814	Hospital Project	project	peer assessment	In vivo experience with medical technology
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture online group work project	report	knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E010610	Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities	oral examination report	The ability to create a basic robotic control loop.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination report open book examination	Critically approaching commonly used statistical methods in medicine and biomedical research
E015590	Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E010382	Neuro-engineering Science	lecture	written examination with open questions	Understand the different neuromodulation techniques and how these are used to study the function of specific brain structures and to influence regions in neurological disorders.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	lecture online project online lecture: plenary exercises online lecture online group work lecture: plenary exercises self-reliant study activities project online discussion group	oral examination report	Design skills of the embedded system aspects. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding the design constraints of the electronic and peripheral components of implantable devices. Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems. System integration, sterilization and packaging aspects of biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems.
E010610	Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities	oral examination report	The ability to create a basic robotic control loop.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	In vivo experience with medical technology
E092802 Biomedical Product Development	project	participation report	Being capable to analyse, synthesize and manage an innovation process.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities		The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities	oral examination report	The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E074123 Artificial Organs	lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092682 Medical Equipment, Safety and Regulations	demonstration lecture		The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities lecture		Understanding of kinematics and dynamics of robots. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital
E092682 Medical Equipment, Safety and Regulations	demonstration lecture		The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010371 Medical Imaging	lecture seminar: practical PC room classes	oral examination report	Understand physical principles of different medical imaging techniques Understand relationship between different image processing techniques Be able to explain the basic principles of the most important techniques in image enhancement, image segmentation and image registration. Be able to judge the advantages and disadvantages of different medical imaging techniques. Have insight in advantages and disadvantages of existing image reconstruction techniques Be capable of defining components of medical imaging systems
E003280 Clinical Study Design and Biostatistics	lecture lecture: response lecture lecture: plenary exercises	written examination report	Critically approaching commonly used statistical methods in medicine and biomedical research
E092814 Hospital Project	project	peer assessment report	In vivo experience with medical technology
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E010382 Neuro-engineering Science	seminar: practical PC room classes	report	Have an insight in the background, methods and interpretation of the different techniques to measure brain activity and signals.
E010600 Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture: plenary exercises online group work lecture: plenary exercises project	oral examination report	Design skills of the embedded system aspects. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding the design constraints of the electronic and peripheral components of implantable devices. Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems. System integration, sterilization and packaging aspects of biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems. Understanding of the contamination control in cleanroom environments.
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092802 Biomedical Product Development	guided self-study project	report	Being capable of presenting and defending a project.
E092682 Medical Equipment, Safety and Regulations	demonstration lecture	written examination with open questions written examination with multiple choice questions	The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities	oral examination report	Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	report	Critically approaching commonly used statistical methods in medicine and biomedical research
E092814	Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital
E015590	Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	project online project online group work online demonstration	report	Understanding of the contamination control in cleanroom environments. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems.
E092802	Biomedical Product Development	project	participation report	Being capable of presenting and defending a project.
E010610	Biomedical Robotics and Assistive Technologies	self-reliant study activities	oral examination	The ability to create a basic robotic control loop.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

<< **EMingwALG4.3 Have the ability to work as a member of a team in a multidisciplinary workingenvironment, as well as being capable of taking on supervisory responsibilities.** *Competences in cooperation and communication*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	In vivo experience with medical technology
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E092802 Biomedical Product Development	project	participation report	Being capable to analyse, synthesize and manage an innovation process. Having no fear to start an innovation project (spin-in, spin-off or start-up).

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E010371	Medical Imaging	seminar: practical PC room classes	oral examination	Understand physical principles of different medical imaging techniques Understand relationship between different image processing techniques Be able to explain the basic principles of the most important techniques in image enhancement, image segmentation and image registration. Be able to judge the advantages and disadvantages of different medical imaging techniques. Have insight in advantages and disadvantages of existing image reconstruction techniques Be capable of defining components of medical imaging systems
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	report	Critically approaching commonly used statistical methods in medicine and biomedical research
E092814	Hospital Project	project	report	Knowledge of functioning of a clinical departement in a hospital
E015590	Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E015570	Health Information and Decision Support Systems	practicum	oral examination	Knowledge of current systems for clinical decision support and computer-aided diagnosis, including expert-based, data driven and intelligent systems.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture: plenary exercises online group work lecture: plenary exercises project	report	Design skills of the embedded system aspects. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding of the contamination control in cleanroom environments.
E010610	Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities	oral examination	Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E003280 Clinical Study Design and Biostatistics	lecture lecture: response lecture	written examination report open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Critically approaching commonly used statistical methods in medicine and biomedical research Understanding the specific considerations in clinical study design for medical devices
E092814 Hospital Project	project	report	Knowledge of functioning of a clinical departement in a hospital
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E092802 Biomedical Product Development	project	participation report	Being capable to analyse, synthesize and manage an innovation process. Being capable of presenting and defending a project. Having no fear to start an innovation project (spin-in, spin-off or start-up). Being capable to write a business plan.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	In vivo experience with medical technology
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E010610 Biomedical Robotics and Assistive Technologies	seminar: coached exercises	oral examination report	The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Critically approaching commonly used statistical methods in medicine and biomedical research Understanding the specific considerations in clinical study design for medical devices
E092814	Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E015590	Leadership in Health Care	project		Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E015570	Health Information and Decision Support Systems	lecture seminar	report	Insight in the current possibilities and opportunities of health information systems and in the technological and legal challenges.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture online group work project	report	knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E010610	Biomedical Robotics and Assistive Technologies	self-reliant study activities seminar: coached exercises	oral examination report	Understanding of the difficulties and challenges of human-robot interaction.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	lecture	written examination open book examination	Understanding the specific considerations in clinical study design for medical devices
E015590	Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E015570	Health Information and Decision Support Systems	lecture seminar	report	Knowledge of current health information systems, including hospital information systems, picture archiving and communication systems, electronic health record, e-health and m-health. Insight in the current possibilities and opportunities of health information systems and in the technological and legal challenges.
E010610	Biomedical Robotics and Assistive Technologies	lecture		Understanding of the difficulties and challenges of human-robot interaction.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E015570	Health Information and Decision Support Systems	lecture	report	Knowledge of current health information systems, including hospital information systems, picture archiving and communication systems, electronic health record, e-health and m-health.
E074123	Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092682	Medical Equipment, Safety and Regulations	demonstration lecture	written examination with open questions written examination with multiple choice questions	The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610	Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture		Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E003280 Clinical Study Design and Biostatistics	lecture lecture: response lecture	written examination open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Understanding the specific considerations in clinical study design for medical devices
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture	oral examination report	Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	lecture lecture: response lecture	written examination report open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Understanding the specific considerations in clinical study design for medical devices
E015570	Health Information and Decision Support Systems	lecture	report	Insight in the current possibilities and opportunities of health information systems and in the technological and legal challenges.
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture online group work project	report	knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E010610	Biomedical Robotics and Assistive Technologies	guided self-study self-reliant study activities lecture		Understanding of the difficulties and challenges of human-robot interaction.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010371 Medical Imaging	lecture	oral examination	Understand physical principles of different medical imaging techniques
E092814 Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E015570 Health Information and Decision Support Systems	lecture	report	Insight in the current possibilities and opportunities of health information systems and in the technological and legal challenges.
E010600 Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture online group work project	report	knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture		Understanding of the difficulties and challenges of human-robot interaction.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E003280 Clinical Study Design and Biostatistics	lecture lecture: response lecture	written examination open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies
E092814 Hospital Project	project	peer assessment	In vivo experience with medical technology
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner.
E092682 Medical Equipment, Safety and Regulations	demonstration lecture		The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture		Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture	oral examination report	Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E074123 Artificial Organs	excursion lecture		To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E027770 Data Analytics in Healthcare and Connected Care	lecture	written examination	Being able to select, for a given healthcare analytics problem, the most appropriate method to achieve the defined goals
E010610 Biomedical Robotics and Assistive Technologies	lecture		Understanding of the difficulties and challenges of human-robot interaction.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital
E092802 Biomedical Product Development	lecture project	participation report	Having no fear to start an innovation project (spin-in, spin-off or start-up).
E027770 Data Analytics in Healthcare and Connected Care	lecture practicum	written examination report skills test	Interpreting and visualizing the results of a machine learning process or the content of medical datasets Being familiar with the basic concepts of database systems and databases and understanding how database systems work Having a comprehensive knowledge of Python for data analytics purposes Being able to construct datasets by querying APIs Having a comprehensive knowledge about the machine learning process where data is transformed into information and knowledge
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

<< **EMingwALG6.4 Possess sufficient ready knowledge and understanding to evaluate the results of complex calculations, or make approximate estimates.** *Profession-specific competence*

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E092814	Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital
E027770	Data Analytics in Healthcare and Connected Care	lecture practicum	written examination report skills test	Being able to select, for a given healthcare analytics problem, the most appropriate method to achieve the defined goals Having a comprehensive knowledge of Python for data analytics purposes Interpreting and visualizing the results of a machine learning process or the content of medical datasets
E010610	Biomedical Robotics and Assistive Technologies	self-reliant study activities		The ability to create a basic robotic control loop.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	In vivo experience with medical technology
E092682 Medical Equipment, Safety and Regulations	demonstration lecture		The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture		Understanding of kinematics and dynamics of robots. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction. Understanding of how a robot is controlled.

<< **EMingwALG6.6 Pay attention to sustainability, energyefficiency, environmental cost, use of raw materials and labour costs.** *Profession-specific competence*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092802 Biomedical Product Development	project	report	Being capable to write a business plan.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E092814	Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture online group work project	report	knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E074123	Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092682	Medical Equipment, Safety and Regulations	demonstration lecture		The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610	Biomedical Robotics and Assistive Technologies	lecture		Understanding of the difficulties and challenges of human-robot interaction.

<< **EMingwALG6.8 Have insight into and understanding of the importance of entrepreneurship.** *Profession-specific competence*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E015590 Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E010610 Biomedical Robotics and Assistive Technologies	self-reliant study activities		The ability to create a basic robotic control loop.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E092814 Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital
E092802 Biomedical Product Development	project	oral examination report participation	Being capable of presenting and defending a project.
E010610 Biomedical Robotics and Assistive Technologies	self-reliant study activities seminar: coached exercises	oral examination report	The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination report open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Understanding the specific considerations in clinical study design for medical devices
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	demonstration online project online lecture: plenary exercises online lecture online group work online demonstration lecture: plenary exercises self-reliant study activities project online discussion group lecture	oral examination report	Design skills of the embedded system aspects. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects Understanding the design constraints of the electronic and peripheral components of implantable devices. Understanding of the micro-and nanofabrication technologies for wearable and implantable biomedical devices and systems. System integration, sterilization and packaging aspects of biomedical devices and systems. Skills to decide on the powering and the telemetry aspects of biomedical devices and systems. Understanding of the contamination control in cleanroom environments.
E074123	Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.
E092682	Medical Equipment, Safety and Regulations	demonstration lecture	written examination with open questions written examination with multiple choice questions	The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610	Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities lecture		Understanding of how a robot is controlled. The ability to create a basic robotic control loop. Understanding of the difficulties and challenges of human-robot interaction.
E091103	Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010610 Biomedical Robotics and Assistive Technologies	lecture seminar: coached exercises self-reliant study activities		Understanding of the difficulties and challenges of human-robot interaction.

<< **EMingwBIOM6.3 Apply the most suitable instruments, concepts, techniques and methods for the solution of real problems in physiology and clinical medicine on molecular, organic and system level.** *Profession-specific competence*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E010610 Biomedical Robotics and Assistive Technologies	guided self-study seminar: coached exercises self-reliant study activities		The ability to create a basic robotic control loop.
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

<< **EMingwBIOM6.4 Target-oriented implementation of algorithms for the extraction of clinically relevant information from biomedical signals or images, including the most suitable method for the reduction of measurement artefacts (baseline drift, noise, interferences, mistakes in the models,...).** *Profession-specific competence*

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E010371	Medical Imaging	lecture seminar: practical PC room classes	oral examination report	Be able to explain the basic principles of the most important techniques in image enhancement, image segmentation and image registration. Understand relationship between different image processing techniques
E003280	Clinical Study Design and Biostatistics	guided self-study lecture: response lecture lecture: plenary exercises lecture	written examination report open book examination	Critically approaching commonly used statistical methods in medicine and biomedical research
E015570	Health Information and Decision Support Systems	lecture practicum	oral examination report	Insight in the development of clinical decision support and computer-aided diagnosis systems.
E010610	Biomedical Robotics and Assistive Technologies	seminar: coached exercises		The ability to create a basic robotic control loop.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	lecture	written examination open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Understanding the specific considerations in clinical study design for medical devices
E092814	Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital
E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	online discussion group online project online lecture: plenary exercises online lecture online group work online demonstration lecture: plenary exercises project	report	Understanding of the contamination control in cleanroom environments. knowledge of the basis priciples regarding regulatory aspects in order to introduce a new medical device on the market, including basis principles of required testing and related ethical aspects
E092682	Medical Equipment, Safety and Regulations	demonstration lecture		The technique, the function and the application (the indication) of the medical devices in a hospital, aspects of safety and regulations.
E010610	Biomedical Robotics and Assistive Technologies	lecture		Understanding of the difficulties and challenges of human-robot interaction.

<< **EMingwBIOM6.6 Correctly assess the role and possibilities of data-processing systems in a local (hospital) and regional environment while being aware of potential problems associated with the implementation of such systems.** *Profession-specific competence*

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E003280	Clinical Study Design and Biostatistics	lecture	written examination open book examination	Acknowledging the importance of clinical trials for health-care decision making and reimbursement of new medical technologies Understanding the specific considerations in clinical study design for medical devices
E092814	Hospital Project	project	peer assessment	Knowledge of functioning of a clinical departement in a hospital In vivo experience with medical technology
E015590	Leadership in Health Care	project	assignment	Insight in leadership and quality-ethical-economical thinking in complex health care issues and medical technology
E015570	Health Information and Decision Support Systems	lecture	report	Knowledge of current health information systems, including hospital information systems, picture archiving and communication systems, electronic health record, e-health and m-health. Knowledge of current systems for clinical decision support and computer-aided diagnosis, including expert-based, data driven and intelligent systems.

<< **EMingwBIOM6.7 Specify the physical and technical-chemical properties of synthetic materials for a wide range of biomedical applications and implement adequate tests.** *Profession-specific competence*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E063671 Biomaterials and Tissue Engineering	group work practicum lecture	written examination report participation	Insights in the potential and limitations of the various biomaterials. Knowledge on methods for in vitro characterization of biomaterials. Knowledge on the various biomaterials and their applied combinations in the medical sector.
E074123 Artificial Organs	excursion lecture	written examination with open questions	To apply the acquired knowledge in artificial organs to concrete problem solving in an organised, accurate and structured manner. To report on technical artificial organ subjects focussing on the scientific correctness and soundness of the statements. To operate independently, with a sense of creativity and personal initiative without losing one's critical thinking.

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*

Course	Teaching methods	Evaluation methods	Course learning outcome

*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*