Competence coverage matrix

GHENT UNIVERSITY

Master of Science in Electromechanical Engineering

Maritime Engineering

Academic year 2021-2022

Legend:
T=teaching methods
E=evaluation methods

			General Courses							Courses Related to the Main Subject								Master's Dissertation
			E036130 Controlled Electrical Drives	E037321 Turbomachines	E037121 Displacement Pumps, Compressors and IC Engine Fundamentals	E019331 ICT and Mechatronics	E040670 Mechanical Vibrations	E076221 Manufacturing Planning and Control	E055270 Hydrostatics and Propulsion of Maritime Constructions	E055030 General Arrangement, Structural Arrangements and Construction of Marine Structures	E055045 Introduction to Maritime Technology	E044311 Structural Stability	E056600 Construction Techniques	E055290 Manoeuvring and Seakeeping Behaviour of Maritime Constructions	E054670 Design of Maritime Structures	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 12 E 12			T E	T E	T E	T E	T E	T E	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 E 2				E							T E			
	Have a thorough insight in the interactions between different electromechanical parts and energy conversions of complex systems.	T 5 E 5	T E		T E	T E			T E							T E
	Have a thorough knowledge of measurement techniques, sensors, actuators and ICT and the ability to apply the knowledge.	T 4 E 3			T E	T E	T									T E
	Be familiar with the management of companies and operations.	T 1 E 1						T E								
	Specifically for main subject 'Mechanical Energy Engineering': Have a thorough insight in mechanical and thermodynamical energy conversions, fluid dynamics, heat transfer and combustion and apply the knowledge to complex problems.	T 3 E 3		T E	T E											T E
	Specifically for main subject 'Electrical Power Engineering': Have a thorough insight in the production, distribution, conversion and use of electrical power and apply the knowledge to complex problems.	T 2 E 2	T E													T E
	Specifically for main subject 'Mechanical Construction': Have a thorough insight in the design, behaviour and manufacturing of constructions and machines and apply the knowledge to complex problems.	T 2 E 2											T E			T E
	Specifically for main subject 'Control Engineering and Automation': Have a thorough insight in the design and behaviour of control loops and of system dynamics and apply the knowledge to complex problems.	T 3 E 3	T E			T E										T E
	Specifically for main subject 'Maritime Engineering': Have a thorough insight in the design, construction, functioning and exploitation of maritime systems.	T 8 E 8							T E	T E	T E	T E	T E	T E	T E	T E
Scientific competences	Analyse complex problems and translate them into concrete research questions.	T 7 E 7				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 1 E 2				E										T E
	Select and apply the appropriate models, methods and techniques.	T 9 E 9	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 2 E 2				E							T			T E
Intellectual competences	Independently form an opinion on complex situations and problems, and defend this point of view.	T 5 E 3	T E					T				T	T E			T E
	Apply knowledge in a creative, purposeful and innovative way to research, conceptual design and production.	T 5 E 6				E	T E			T E			T E	T E		T E
	Critically reflect on one's own way of thinking and acting, and understand the limits of one's competences.	T 2 E 2				T E										T E
	Stay uptodate with the evolutions in the discipline to elevate the own competences to expert level.	T 4 E 3	T E			T						T E				T E
	Readily adapt to changing professional circumstances.	T 2 E 1				T										T E
Competences in cooperation and communication	Have the ability to communicate in English about the own field of specialisation.	T 9 E 9	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 4 E 4			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 1 E 1				T E										
	Report on technical or scientific subjects verbally, in writing and using graphics.	T 7 E 7	T E		T E	E	T E				T E	T E	T			T E
Societal competences	Act in an ethical, professional and social way.	T 4 E 3	T E		T								T E			T E
	Recognize the most important business and legal aspects of the own engineering discipline.	T 3 E 2						T	T E		T E					
	Understand the historical evolution of the own engineering discipline and its social relevance.	T 4 E 3				T			T E		T E					T E
Profession-specific competence	Master the complexity of technical systems by using system and process models.	T 6 E 6	T E		T E	T E	T E	T E								T E
	Reconcile conflicting specifications and prior conditions in a high quality and innovative concept or process.	T 3 E 3				T E							T E			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 7 E 6	T E	T E		T E	T					T E	T E			T E
	Pay attention to entire life cycles of systems, machines, and processes.	T 2	T			T										

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			E036130 Controlled Electrical Drives	E037321 Turbomachines	E037121 Displacement Pumps, Compressors and IC Engine Fundamentals	E019331 ICT and Mechatronics	E040670 Mechanical Vibrations	E076221 Manufacturing Planning and Control	E055270 Hydrostatics and Propulsion of Maritime Constructions	E055030 General Arrangement, Structural Arrangements and Construction of Marine Structures	E055045 Introduction to Maritime Technology	E044311 Structural Stability	E056600 Construction Techniques	E055290 Manoeuvring and Seakeeping Behaviour of Maritime Constructions	E054670 Design of Maritime Structures	E091103 Master's Dissertation
Profession-specific competence	Pay attention to sustainability, energyefficiency, environmental cost, use of raw materials and labour costs.	T 4 E 2	T		T				T E				T E			
	Pay attention to all aspects of reliability, safety, and ergonomics.	T 6 E 5	T			T E			T E		T E	T E	T E			
	Have insight into and understanding of the importance of entrepreneurship.															
	Show perseverance, innovativeness, and an aptitude for creating added value.	T 3 E 2				T E						T				T E
	Integrate the advanced knowledge of mechanical and electrical systems and ICT in order to design, implement and exploit technological innovations.	T 2 E 2				T E										T E
	Be familiar with the energy efficiency of (electrical, mechanical and thermal) energy conversion systems and distribution systems.	T 5 E 4	T E	T E	T				T E							T E
			W 15 E 12	W 3 E 3	W 11 E 8	W 22 E 23	W 10 E 8	W 7 E 5	W 11 E 11	W 3 E 3	W 11 E 11	W 11 E 9	W 15 E 13	W 5 E 5	W 2 E 2	W 29 E 29

<< 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*			
E037121 Displacement Pumps, Compressors and IC Engine Fundamentals	lecture seminar practicum	report	Execute thermodynamic analyses of displacement machines and calculate performance parameters. Choose a suitable pump, compressor or internal combustion engine type depending on the application and determine its basic dimensions. Analyse and interpret measurements on positive displacement machinery. Explain trends in engine design, fuel choice and emission legislation and explain why a specific engine design would be chosen according to the needs of the application. Calculate the margin to cavitation for a pump installation and if necessary propose the required adaptations.
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	guided self-study seminar: coached exercises lecture	oral examination	Modelling of rotating and non-rotating mechanical systems based on Langrange's technique. Apply model structure preserving reduction techniques. Identify modal parameters from an experiment Design of vibration isolation and vibration absorption devices. Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Calculate vibration levels of mechanical structures subjected to dynamic loads.
E076221 Manufacturing Planning and Control	lecture seminar: coached exercises practicum	written examination	distinguish and correctly apply methods and tools for planning production and inventory at strategic, tactical and operational level assess the usefulness of the different methods and tools for shop floor control in varying situations
E055270 Hydrostatics and Propulsion of Maritime Constructions	excursion seminar: coached exercises lecture	open book examination report oral examination	Acquire insight in the hydrodynamic aspects of ship vibrations and underwater radiated noise. Distinguish and explain the different physical causes of ship resistance. Understand and analyse the effects of supporting contact of a floating structure on the bottom (grounding, docking) on hydrostatics and stability. Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved. Understand and analyse the physical background of the consequences of damage to a ship on hydrostatics and stability. Distinguish the regulatory principles on which the criteria for damaged ships are based. Be capable to solve realistic problems concerning damage calculations of ships in a simplified way. Be capable of executing damage calculations by means of specialised software. Be capable to solve realistic problems concerning floating structures supported by the bottom in a simplified way.
E055030 General Arrangement, Structural Arrangements and Construction of Marine Structures	lecture project	oral examination report	Possess basic knowledge, required for the design, construction, control or exploitation of maritime constructions. Gaining insights in the different failure mechanisms as a result of the load on a maritime construction. Apply direct calculation, based on material strength, and the use of class rules for the design of maritime constructions. To be able to explain the mathematical and scientifical basis in relation to used formulae in the design of a maritime construction. Assessment and estimation of the strength of parts and elements of a maritime construction. Understand the calculation methodology for the design of basic parts and elements of maritime constructions. To be able to explain the relationship between the load, the response and the strength of maritime constructions.

E055045	Introduction to Maritime Technology	guided self-study seminar: coached exercises lecture	open book examination report oral examination	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Reason out the manoeuvring behaviour of a ship. Distinguish the most important characterstics of a ship's steering equipment (rudder). Define the main techniques used to determine and evaluate a ship' s manoeuvring behaviour. Gain insight into hydrostatics and stability of floating structures. Get acquinted with the specific hydrodynamic behaviour of a ship in shallow and confined navigation areas. Assess ship stability with respect to international conventions. Analyse the stability of floating structures, including the effects of free fluid surfaces, hanging weights, movable cargo. Distinguish the most important physical causes of a ship's resistance. Reason out the most important parameters on which a ship's resistance depends. Define and recognise the most usual technologies used for a ship's propulsion. Describe the main players in the shipping world. Get acquainted with professional terminology concerning external characteristics, structure and primary members of maritime constructions. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software. Give an explanation for the dynamic behaviour of a floating structure in waves. Be able to use professional terminology with respect to the behaviour of floating structures in waves.
E044311	Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600	Construction Techniques	guided self-study seminar: coached exercises lecture	open book examination oral examination	Understand the physical principles of joining techniques. Calculate the strength of joints. Recognize and remediate defects in joints. Constructive design of joints. Analyse and explain the load transfer in joints. Select the most suited joining technique for a specific application. Critically compare different joining techniques. Know the applications of joining techniques. List the advantages and disadvantages of joining techniques. Describe the technological aspects of joining techniques.
E055290	Manoeuvring and Seakeeping Behaviour of Maritime Constructions	lecture practicum	open book examination report oral examination	Be able to explain the physical background and derive the mathematical formulation of the main hydrodynamic coefficients of the linear equations of motion for sway and yaw. Be able to apply seakeeping software for determining the response characteristics of ships or other floating structures to regular waves and for calculating exceedance probabilities for undesired effects in irregular seas. Be able to derive and interprete the mathematical background of autopilots for ships. Gain insight into the manoeuvring and steering behaviour of ships by means of linear theory. Explain and analyse the efffect of the principal parameters determining the manoeuvring and steering behaviour of ships. Derive, interprete and apply the mathematical formulation of the response spectrum of a ship or floating structure on an irregular sea. Calculate exceedance probabilities for undesired effects (slamming, shipping of water, ...). Gain insight into the mathematical modelling of a ship's manoeuvring behaviour for simulation purposes. Acquire insight into the non-linear aspects of the roll motion of ships. Explain the physical and mathematical background and describe the practical realisation of technical solutions for reducing the roll motion of ships. Be capable of explaining the physical phenomena on which the motion response of a ship or another floating structure due to regular waves is based. Be capable of composing the mathematical representation of the heave, pitch and roll response of a ship to regular waves by means of linear wave theory and strip theory. Be able to explain the physical background and the mathematical formulation of the hydrodynamic forces acting on a rudder. Distinguish the main types and realisations of rudders and other steering equipment for ships and their application ranges. Describe and apply the characteristics and properties of an irregular seaway by means of (directional) wave spectra. Determine the main rudder characteristics in a concept design phase. Explain and interprete the execution and results of standard manoeuvres.
E054670	Design of Maritime Structures	lecture	oral examination	Skills: Structural design of maritime structures according to probabilistic methods
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*			
E019331 ICT and Mechatronics	Only evaluation	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E056600 Construction Techniques	guided self-study seminar: coached exercises lecture	open book examination	Constructive design of joints. Calculate the strength of joints.

<< **EMingwELME1.1 Have a thorough insight in the interactions between different electromechanical parts and energy conversions of complex systems.** *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*				
E036130	Controlled Electrical Drives	lecture	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037121	Displacement Pumps, Compressors and IC Engine Fundamentals	practicum	report	Analyse and interpret measurements on positive displacement machinery.
E019331	ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E055270	Hydrostatics and Propulsion of Maritime Constructions	lecture seminar: coached exercises	open book examination report oral examination	Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved.
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.

<< **EMingwELME1.2 Have a thorough knowledge of measurement techniques, sensors, actuators and ICT and the ability to apply the knowledge.** *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*				
E037121	Displacement Pumps, Compressors and IC Engine Fundamentals	practicum	report	Analyse and interpret measurements on positive displacement machinery.
E019331	ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670	Mechanical Vibrations	seminar: coached exercises		Identify modal parameters from an experiment
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*			
E076221 Manufacturing Planning and Control	lecture seminar: coached exercises practicum	written examination	indicate the strategic importance of production planning and control for a company assess the usefulness of the different methods and tools for shop floor control in varying situations distinguish and correctly apply methods and tools for planning production and inventory at strategic, tactical and operational level quantify the impact of variability on the performance of a production system analyse and control complex production systems by using mathematical models

<< **EMingwELME1.4 Specifically for main subject 'Mechanical Energy Engineering': Have a thorough insight in mechanical and thermodynamical energy conversions, fluid dynamics, heat transfer and combustion and apply the knowledge to 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*				
E037321	Turbomachines	guided self-study lecture	oral examination	Derive parameter choice and layout of fans, steam turbines, pumps, hydraulic turbines and wind turbines Derive basic functioning of turbomachines and the flow in their components
E037121	Displacement Pumps, Compressors and IC Engine Fundamentals	lecture seminar practicum	report	Execute thermodynamic analyses of displacement machines and calculate performance parameters. Choose a suitable pump, compressor or internal combustion engine type depending on the application and determine its basic dimensions. Analyse and interpret measurements on positive displacement machinery. Explain trends in engine design, fuel choice and emission legislation and explain why a specific engine design would be chosen according to the needs of the application. Calculate the margin to cavitation for a pump installation and if necessary propose the required adaptations.
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.

<< **EMingwELME1.5 Specifically for main subject 'Electrical Power Engineering': Have a thorough insight in the production, distribution, conversion and use of electrical power and apply the knowledge to 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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises practicum	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
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.

<< **EMingwELME1.6 Specifically for main subject 'Mechanical Construction': Have a thorough insight in the design, behaviour and manufacturing of constructions and machines and apply the knowledge to 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*			
E056600 Construction Techniques	guided self-study seminar: coached exercises microteaching lecture excursion	open book examination oral examination	Understand the physical principles of joining techniques. Calculate the strength of joints. Recognize and remediate defects in joints. Constructive design of joints. Analyse and explain the load transfer in joints. Select the most suited joining technique for a specific application. Critically compare different joining techniques. Know the applications of joining techniques. List the advantages and disadvantages of joining techniques. Describe the technological aspects of joining techniques.
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.

<< **EMingwELME1.7 Specifically for main subject 'Control Engineering and Automation': Have a thorough insight in the design and behaviour of control loops and of system dynamics and apply the knowledge to 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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
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*			
E055270 Hydrostatics and Propulsion of Maritime Constructions	excursion seminar: coached exercises lecture	open book examination report oral examination	Acquire insight in the hydrodynamic aspects of ship vibrations and underwater radiated noise. Distinguish and explain the different physical causes of ship resistance. Understand and analyse the effects of supporting contact of a floating structure on the bottom (grounding, docking) on hydrostatics and stability. Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved. Understand and analyse the physical background of the consequences of damage to a ship on hydrostatics and stability. Distinguish the regulatory principles on which the criteria for damaged ships are based. Be capable to solve realistic problems concerning damage calculations of ships in a simplified way. Be capable of executing damage calculations by means of specialised software. Be capable to solve realistic problems concerning floating structures supported by the bottom in a simplified way.
E055030 General Arrangement, Structural Arrangements and Construction of Marine Structures	lecture project	oral examination report	Possess basic knowledge, required for the design, construction, control or exploitation of maritime constructions. Gaining insights in the different failure mechanisms as a result of the load on a maritime construction. Apply direct calculation, based on material strength, and the use of class rules for the design of maritime constructions. To be able to explain the mathematical and scientifical basis in relation to used formulae in the design of a maritime construction. Master the terminology in relation to maritime constructions, structure and exploitation. Assessment and estimation of the strength of parts and elements of a maritime construction. Description and naming of the relevant parts of maritime constructions. Understand the calculation methodology for the design of basic parts and elements of maritime constructions. To be able to explain the relationship between the load, the response and the strength of maritime constructions.
E055045 Introduction to Maritime Technology	guided self-study seminar: coached exercises lecture	open book examination report oral examination	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Reason out the manoeuvring behaviour of a ship. Distinguish the most important characterstics of a ship's steering equipment (rudder). Define the main techniques used to determine and evaluate a ship' s manoeuvring behaviour. Gain insight into hydrostatics and stability of floating structures. Get acquinted with the specific hydrodynamic behaviour of a ship in shallow and confined navigation areas. Assess ship stability with respect to international conventions. Analyse the stability of floating structures, including the effects of free fluid surfaces, hanging weights, movable cargo. Distinguish the most important physical causes of a ship's resistance. Reason out the most important parameters on which a ship's resistance depends. Define and recognise the most usual technologies used for a ship's propulsion. Describe the main players in the shipping world. Get acquainted with professional terminology concerning external characteristics, structure and primary members of maritime constructions. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software. Give an explanation for the dynamic behaviour of a floating structure in waves. Be able to use professional terminology with respect to the behaviour of floating structures in waves.
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600 Construction Techniques	guided self-study seminar: coached exercises lecture	open book examination oral examination	Understand the physical principles of joining techniques. Calculate the strength of joints. Recognize and remediate defects in joints. Constructive design of joints. Analyse and explain the load transfer in joints. Select the most suited joining technique for a specific application. Critically compare different joining techniques. Know the applications of joining techniques. List the advantages and disadvantages of joining techniques. Describe the technological aspects of joining techniques.
E055290 Manoeuvring and Seakeeping Behaviour of Maritime Constructions	lecture practicum	open book examination report oral examination	Be able to explain the physical background and derive the mathematical formulation of the main hydrodynamic coefficients of the linear equations of motion for sway and yaw. Be able to apply seakeeping software for determining the response characteristics of ships or other floating structures to regular waves and for calculating exceedance probabilities for undesired effects in irregular seas. Be able to derive and interprete the mathematical background of autopilots for ships. Gain insight into the manoeuvring and steering behaviour of ships by means of linear theory. Explain and analyse the efffect of the principal parameters determining the manoeuvring and steering behaviour of ships. Derive, interprete and apply the mathematical formulation of the response spectrum of a ship or floating structure on an irregular sea. Calculate exceedance probabilities for undesired effects (slamming, shipping of water, ...). Gain insight into the mathematical modelling of a ship's manoeuvring behaviour for simulation purposes. Acquire insight into the non-linear aspects of the roll motion of ships. Explain the physical and mathematical background and describe the practical realisation of technical solutions for reducing the roll motion of ships. Be capable of explaining the physical phenomena on which the motion response of a ship or another floating structure due to regular waves is based. Be capable of composing the mathematical representation of the heave, pitch and roll response of a ship to regular waves by means of linear wave theory and strip theory. Be able to explain the physical background and the mathematical formulation of the hydrodynamic forces acting on a rudder. Distinguish the main types and realisations of rudders and other steering equipment for ships and their application ranges. Describe and apply the characteristics and properties of an irregular seaway by means of (directional) wave spectra. Determine the main rudder characteristics in a concept design phase. Explain and interprete the execution and results of standard manoeuvres.
E054670 Design of Maritime Structures	lecture	oral examination	Skills: Structural design of maritime structures according to probabilistic methods Concepts: Reliability of constructions; Safety assessment of systems Insights: Physical insight into the failure mechanisms for large steel structures; The probabilistic character of loads and capability.

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*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	guided self-study seminar: coached exercises lecture	oral examination	Modelling of rotating and non-rotating mechanical systems based on Langrange's technique. Apply model structure preserving reduction techniques. Identify modal parameters from an experiment Design of vibration isolation and vibration absorption devices. Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Calculate vibration levels of mechanical structures subjected to dynamic loads.
E055270 Hydrostatics and Propulsion of Maritime Constructions	seminar: coached exercises	open book examination report	Be capable to solve realistic problems concerning floating structures supported by the bottom in a simplified way. Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved. Be capable to solve realistic problems concerning damage calculations of ships in a simplified way. Be capable of executing damage calculations by means of specialised software.
E055045 Introduction to Maritime Technology	guided self-study seminar: coached exercises	open book examination report	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software.
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E055290 Manoeuvring and Seakeeping Behaviour of Maritime Constructions	lecture practicum	open book examination report oral examination	Be able to explain the physical background and derive the mathematical formulation of the main hydrodynamic coefficients of the linear equations of motion for sway and yaw. Be able to apply seakeeping software for determining the response characteristics of ships or other floating structures to regular waves and for calculating exceedance probabilities for undesired effects in irregular seas. Be able to derive and interprete the mathematical background of autopilots for ships. Gain insight into the manoeuvring and steering behaviour of ships by means of linear theory. Explain and analyse the efffect of the principal parameters determining the manoeuvring and steering behaviour of ships. Derive, interprete and apply the mathematical formulation of the response spectrum of a ship or floating structure on an irregular sea. Calculate exceedance probabilities for undesired effects (slamming, shipping of water, ...). Gain insight into the mathematical modelling of a ship's manoeuvring behaviour for simulation purposes. Acquire insight into the non-linear aspects of the roll motion of ships. Explain the physical and mathematical background and describe the practical realisation of technical solutions for reducing the roll motion of ships. Be capable of explaining the physical phenomena on which the motion response of a ship or another floating structure due to regular waves is based. Be capable of composing the mathematical representation of the heave, pitch and roll response of a ship to regular waves by means of linear wave theory and strip theory. Be able to explain the physical background and the mathematical formulation of the hydrodynamic forces acting on a rudder. Distinguish the main types and realisations of rudders and other steering equipment for ships and their application ranges. Describe and apply the characteristics and properties of an irregular seaway by means of (directional) wave spectra. Determine the main rudder characteristics in a concept design phase. Explain and interprete the execution and results of standard manoeuvres.
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*			
E019331 ICT and Mechatronics	Only evaluation	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises practicum	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	guided self-study seminar: coached exercises lecture	oral examination	Modelling of rotating and non-rotating mechanical systems based on Langrange's technique. Apply model structure preserving reduction techniques. Identify modal parameters from an experiment Design of vibration isolation and vibration absorption devices. Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Calculate vibration levels of mechanical structures subjected to dynamic loads.
E076221 Manufacturing Planning and Control	lecture seminar: coached exercises practicum	written examination	distinguish and correctly apply methods and tools for planning production and inventory at strategic, tactical and operational level assess the usefulness of the different methods and tools for shop floor control in varying situations
E055045 Introduction to Maritime Technology	guided self-study seminar: coached exercises	open book examination report	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software.
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600 Construction Techniques	guided self-study lecture	oral examination	Know the applications of joining techniques. Select the most suited joining technique for a specific application. Critically compare different joining techniques.
E055290 Manoeuvring and Seakeeping Behaviour of Maritime Constructions	lecture practicum	open book examination report oral examination	Be able to explain the physical background and derive the mathematical formulation of the main hydrodynamic coefficients of the linear equations of motion for sway and yaw. Be able to derive and interprete the mathematical background of autopilots for ships. Gain insight into the manoeuvring and steering behaviour of ships by means of linear theory. Explain and analyse the efffect of the principal parameters determining the manoeuvring and steering behaviour of ships. Derive, interprete and apply the mathematical formulation of the response spectrum of a ship or floating structure on an irregular sea. Calculate exceedance probabilities for undesired effects (slamming, shipping of water, ...). Gain insight into the mathematical modelling of a ship's manoeuvring behaviour for simulation purposes. Be capable of explaining the physical phenomena on which the motion response of a ship or another floating structure due to regular waves is based. Be capable of composing the mathematical representation of the heave, pitch and roll response of a ship to regular waves by means of linear wave theory and strip theory. Be able to explain the physical background and the mathematical formulation of the hydrodynamic forces acting on a rudder. Distinguish the main types and realisations of rudders and other steering equipment for ships and their application ranges. Describe and apply the characteristics and properties of an irregular seaway by means of (directional) wave spectra. Determine the main rudder characteristics in a concept design phase.
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*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	guided self-study seminar: coached exercises lecture	oral examination	Modelling of rotating and non-rotating mechanical systems based on Langrange's technique. Apply model structure preserving reduction techniques. Identify modal parameters from an experiment Design of vibration isolation and vibration absorption devices. Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Calculate vibration levels of mechanical structures subjected to dynamic loads.
E076221 Manufacturing Planning and Control	lecture seminar: coached exercises	written examination	analyse and control complex production systems by using mathematical models quantify the impact of variability on the performance of a production system

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E019331 ICT and Mechatronics	Only evaluation	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E056600 Construction Techniques	microteaching		Analyse, summarize and present scientific literature related to joining techniques (only for the engineering programmes).
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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E076221 Manufacturing Planning and Control	lecture		assess the usefulness of the different methods and tools for shop floor control in varying situations
E044311 Structural Stability	guided self-study seminar: coached exercises lecture		To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600 Construction Techniques	guided self-study lecture	oral examination	Know the applications of joining techniques. Select the most suited joining technique for a specific application. Critically compare different joining techniques.
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*			
E019331 ICT and Mechatronics	Only evaluation	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	seminar: coached exercises	oral examination	Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Apply model structure preserving reduction techniques. Design of vibration isolation and vibration absorption devices.
E055030 General Arrangement, Structural Arrangements and Construction of Marine Structures	project	oral examination report	Assessment and estimation of the strength of parts and elements of a maritime construction. Apply direct calculation, based on material strength, and the use of class rules for the design of maritime constructions.
E056600 Construction Techniques	guided self-study seminar: coached exercises lecture	open book examination oral examination	Select the most suited joining technique for a specific application. Calculate the strength of joints. Recognize and remediate defects in joints. Constructive design of joints. Analyse and explain the load transfer in joints.
E055290 Manoeuvring and Seakeeping Behaviour of Maritime Constructions	practicum	open book examination report	Explain and interprete the execution and results of standard manoeuvres. Be able to apply seakeeping software for determining the response characteristics of ships or other floating structures to regular waves and for calculating exceedance probabilities for undesired effects in irregular seas. Determine the main rudder characteristics in a concept design phase.
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.

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*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E019331 ICT and Mechatronics	guided self-study seminar project lecture		Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
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
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E019331 ICT and Mechatronics	guided self-study seminar project lecture		Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises practicum	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037121 Displacement Pumps, Compressors and IC Engine Fundamentals	lecture seminar practicum	report	Calculate the margin to cavitation for a pump installation and if necessary propose the required adaptations. Choose a suitable pump, compressor or internal combustion engine type depending on the application and determine its basic dimensions. Analyse and interpret measurements on positive displacement machinery. Explain trends in engine design, fuel choice and emission legislation and explain why a specific engine design would be chosen according to the needs of the application.
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	lecture	oral examination	Modelling of rotating and non-rotating mechanical systems based on Langrange's technique. Apply model structure preserving reduction techniques. Identify modal parameters from an experiment Design of vibration isolation and vibration absorption devices. Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Calculate vibration levels of mechanical structures subjected to dynamic loads.
E055270 Hydrostatics and Propulsion of Maritime Constructions	lecture seminar: coached exercises	open book examination report oral examination	Acquire insight in the hydrodynamic aspects of ship vibrations and underwater radiated noise. Distinguish and explain the different physical causes of ship resistance. Understand and analyse the effects of supporting contact of a floating structure on the bottom (grounding, docking) on hydrostatics and stability. Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved. Understand and analyse the physical background of the consequences of damage to a ship on hydrostatics and stability. Distinguish the regulatory principles on which the criteria for damaged ships are based. Be capable to solve realistic problems concerning damage calculations of ships in a simplified way. Be capable of executing damage calculations by means of specialised software. Be capable to solve realistic problems concerning floating structures supported by the bottom in a simplified way.
E055045 Introduction to Maritime Technology	guided self-study seminar: coached exercises lecture	open book examination report oral examination	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Reason out the manoeuvring behaviour of a ship. Distinguish the most important characterstics of a ship's steering equipment (rudder). Define the main techniques used to determine and evaluate a ship' s manoeuvring behaviour. Gain insight into hydrostatics and stability of floating structures. Get acquinted with the specific hydrodynamic behaviour of a ship in shallow and confined navigation areas. Assess ship stability with respect to international conventions. Analyse the stability of floating structures, including the effects of free fluid surfaces, hanging weights, movable cargo. Distinguish the most important physical causes of a ship's resistance. Reason out the most important parameters on which a ship's resistance depends. Define and recognise the most usual technologies used for a ship's propulsion. Describe the main players in the shipping world. Get acquainted with professional terminology concerning external characteristics, structure and primary members of maritime constructions. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software. Give an explanation for the dynamic behaviour of a floating structure in waves. Be able to use professional terminology with respect to the behaviour of floating structures in waves.
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600 Construction Techniques	guided self-study microteaching lecture	oral examination	Understand terminology specific to joining techniques. Analyse, summarize and present scientific literature related to joining techniques (only for the engineering programmes).
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*				
E037121	Displacement Pumps, Compressors and IC Engine Fundamentals	practicum	report	Analyse and interpret measurements on positive displacement machinery.
E019331	ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E055045	Introduction to Maritime Technology	seminar: coached exercises	report	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software.
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*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E036130 Controlled Electrical Drives	practicum	skills test	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037121 Displacement Pumps, Compressors and IC Engine Fundamentals	practicum	report	Analyse and interpret measurements on positive displacement machinery.
E019331 ICT and Mechatronics	Only evaluation	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	lecture seminar: coached exercises	report	Modelling of rotating and non-rotating mechanical systems based on Langrange's technique. Perform a modal analysis and formulate structural modifications for continuous and discrete systems.
E055045 Introduction to Maritime Technology	guided self-study seminar: coached exercises	open book examination report	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software.
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600 Construction Techniques	microteaching		Analyse, summarize and present scientific literature related to joining techniques (only for the engineering programmes).
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*				
E036130	Controlled Electrical Drives	lecture seminar: coached exercises	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037121	Displacement Pumps, Compressors and IC Engine Fundamentals	lecture		Explain trends in engine design, fuel choice and emission legislation and explain why a specific engine design would be chosen according to the needs of the application.
E056600	Construction Techniques	guided self-study lecture	oral examination	Be aware of societal aspects (safety, economy, sustainability) specific to joining techniques.
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*				
E076221	Manufacturing Planning and Control	lecture		indicate the strategic importance of production planning and control for a company
E055270	Hydrostatics and Propulsion of Maritime Constructions	lecture	oral examination	Understand and analyse the physical background of the consequences of damage to a ship on hydrostatics and stability. Distinguish the regulatory principles on which the criteria for damaged ships are based.
E055045	Introduction to Maritime Technology	lecture	oral examination	Describe the main players in the shipping world. Reason out the manoeuvring behaviour of a ship. Distinguish the most important characterstics of a ship's steering equipment (rudder). Define the main techniques used to determine and evaluate a ship' s manoeuvring behaviour. Assess ship stability with respect to international conventions.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture		Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E055270 Hydrostatics and Propulsion of Maritime Constructions	lecture	oral examination	Understand and analyse the physical background of the consequences of damage to a ship on hydrostatics and stability. Distinguish the regulatory principles on which the criteria for damaged ships are based. Distinguish and explain the different physical causes of ship resistance.
E055045 Introduction to Maritime Technology	lecture	oral examination	Get acquainted with professional terminology concerning external characteristics, structure and primary members of maritime constructions. Distinguish the most important physical causes of a ship's resistance. Reason out the most important parameters on which a ship's resistance depends. Define and recognise the most usual technologies used for a ship's propulsion.
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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037121 Displacement Pumps, Compressors and IC Engine Fundamentals	practicum seminar	report	Execute thermodynamic analyses of displacement machines and calculate performance parameters. Choose a suitable pump, compressor or internal combustion engine type depending on the application and determine its basic dimensions. Analyse and interpret measurements on positive displacement machinery. Calculate the margin to cavitation for a pump installation and if necessary propose the required adaptations.
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	guided self-study seminar: coached exercises lecture	oral examination	Modelling of rotating and non-rotating mechanical systems based on Langrange's technique. Apply model structure preserving reduction techniques. Identify modal parameters from an experiment Design of vibration isolation and vibration absorption devices. Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Calculate vibration levels of mechanical structures subjected to dynamic loads.
E076221 Manufacturing Planning and Control	lecture seminar: coached exercises	written examination	analyse and control complex production systems by using mathematical models quantify the impact of variability on the performance of a production system
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*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E056600 Construction Techniques	guided self-study lecture	oral examination	Know the applications of joining techniques. Select the most suited joining technique for a specific application.
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*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E055270 Hydrostatics and Propulsion of Maritime Constructions	seminar: coached exercises	open book examination report	Be capable to solve realistic problems concerning floating structures supported by the bottom in a simplified way. Distinguish and explain the different physical causes of ship resistance. Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved. Be capable to solve realistic problems concerning damage calculations of ships in a simplified way. Be capable of executing damage calculations by means of specialised software.
E055045 Introduction to Maritime Technology	guided self-study seminar: coached exercises	open book examination report	Analyse specific problems concerning hydrostatics and stability of ships and other floating structures. Execute hydrostatic calculations and stability calculations for a ship by means of specialised software.
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*			
E036130 Controlled Electrical Drives	lecture seminar: coached exercises practicum	open book examination skills test	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037321 Turbomachines	practicum seminar: coached exercises	written examination	Calculate the flow in a turbomachine using one-dimensional analysis
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E040670 Mechanical Vibrations	seminar: coached exercises		Perform a modal analysis and formulate structural modifications for continuous and discrete systems. Apply model structure preserving reduction techniques. Identify modal parameters from an experiment Design of vibration isolation and vibration absorption devices.
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600 Construction Techniques	lecture seminar: coached exercises	open book examination	Analyse and explain the load transfer in joints. Calculate the strength of joints. Constructive design of joints.
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*			
E036130 Controlled Electrical Drives	lecture		Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E019331 ICT and Mechatronics	guided self-study seminar project lecture		Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E036130	Controlled Electrical Drives	lecture seminar: coached exercises		Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037121	Displacement Pumps, Compressors and IC Engine Fundamentals	lecture		Explain trends in engine design, fuel choice and emission legislation and explain why a specific engine design would be chosen according to the needs of the application. Choose a suitable pump, compressor or internal combustion engine type depending on the application and determine its basic dimensions.
E055270	Hydrostatics and Propulsion of Maritime Constructions	lecture seminar: coached exercises	open book examination report oral examination	Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved. Distinguish and explain the different physical causes of ship resistance.
E056600	Construction Techniques	guided self-study lecture	oral examination	Be aware of societal aspects (safety, economy, sustainability) specific to joining techniques.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E036130 Controlled Electrical Drives	lecture		Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E055270 Hydrostatics and Propulsion of Maritime Constructions	lecture	open book examination report	Acquire insight in the hydrodynamic aspects of ship vibrations and underwater radiated noise. Understand and analyse the physical background of the consequences of damage to a ship on hydrostatics and stability. Distinguish the regulatory principles on which the criteria for damaged ships are based. Be capable to solve realistic problems concerning damage calculations of ships in a simplified way. Be capable of executing damage calculations by means of specialised software.
E055045 Introduction to Maritime Technology	lecture	oral examination	Analyse the stability of floating structures, including the effects of free fluid surfaces, hanging weights, movable cargo. Reason out the manoeuvring behaviour of a ship. Distinguish the most important characterstics of a ship's steering equipment (rudder). Define the main techniques used to determine and evaluate a ship' s manoeuvring behaviour. Gain insight into hydrostatics and stability of floating structures. Get acquinted with the specific hydrodynamic behaviour of a ship in shallow and confined navigation areas. Assess ship stability with respect to international conventions.
E044311 Structural Stability	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
E056600 Construction Techniques	guided self-study lecture	oral examination	Be aware of societal aspects (safety, economy, sustainability) specific to joining techniques.

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

Course	Teaching methods	Evaluation methods	Course learning outcome

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Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
E044311 Structural Stability	guided self-study seminar: coached exercises lecture		To be able to design and to calculate a frame taking into account geometrically non linear behaviour. To perceive possible instabilities and being able to find out the nature of the equilibrium (stable, indifferent or unstable). To understand the effect of imperfections on the behaviour of structures. Being able to solve basic instability problems. Being able to design a twofold compression member. Being able to calculate the resistance of a structural element subjected to warping torsion, lateral torsional buckling, folding and excentric compression. To understand and to be able to apply the theory of non linear behaviour of structures.
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.

<< **EMingwELME6.1 Integrate the advanced knowledge of mechanical and electrical systems and ICT in order to design, implement and exploit technological innovations.** *Profession-specific competence*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E019331 ICT and Mechatronics	guided self-study seminar project lecture	written examination report skills test oral examination	Understanding the reasoning and assumptions behind correct data handling and interpretation, information extraction and machine learning Represent simple motion systems with matrix groups and realize their limitations Discriminate between different task organizations: layers, parallel threads, object oriented Understand basic communication techniques: setting up communication, choosing information channel and information content Design and implement computer-based motion control strategies Name relevant techniques and recognize the dangers for multiple-task management Understand how basic components of complex mechatronic systems work, especially on the ICT side Propose, analyze, select and implement hard- and software solutions for sensing and actuation in a newly encountered mechatronic system
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*				
E036130	Controlled Electrical Drives	lecture seminar: coached exercises	open book examination	Understanding the differences and similarities between space vectors and time phasors for sinusoidal and non-sinusoidal supply Gaining insight into the differences and similarities between space vectors and (time) phasors, voltage and temperature limits for starting, restraints with classical starting methods, power electronic starting methods, voltage and speed control, current and torque control, forced and load commutation in VSI and CSI, differences and similarities between controlled drives and servo drives, small versus large commutator machines, AC commutator machines versus DC commutator machines, small versus large induction machines, small versus large synchronous machines, effects of power electronic supply on the machine and vice-versa, stepping motors versus classical motors Understanding the principle of current supply versus voltage supply, schemes and modulation principles for inverters, equivalent circuits for inverters, V/F supply, vector control and field orientation, DTC (direct torque control), servo drives, shaded pole motor, p.m. excitation, hystereis motor, stepping motors and their characteristics
E037321	Turbomachines	guided self-study lecture	oral examination	Derive parameter choice and layout of fans, steam turbines, pumps, hydraulic turbines and wind turbines
E037121	Displacement Pumps, Compressors and IC Engine Fundamentals	lecture		Explain trends in engine design, fuel choice and emission legislation and explain why a specific engine design would be chosen according to the needs of the application. Choose a suitable pump, compressor or internal combustion engine type depending on the application and determine its basic dimensions.
E055270	Hydrostatics and Propulsion of Maritime Constructions	lecture seminar: coached exercises	open book examination report oral examination	Derive the power flow in the conversion from mechanical power to resistance power and define the efficiencies involved.
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.