Competence coverage matrix

GHENT UNIVERSITY

Master of Science in Engineering Physics

Academic year 2021-2022

Legend:
T=teaching methods
E=evaluation methods

			General Courses									Master's Dissertation
			E026221 Plasma Physics	E002683 Mathematical Techniques for Engineers: Advanced Topics	E025010 Atomic and Molecular Physics	E022700 Computational Solutions of Wave Problems	E025600 Nuclear Physics: Principles and Applications	E029040 Physical Chemistry	E024641 Physics of Semiconductor Devices	E025700 Engineering Physics and Industry	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 7 E 7	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 2 E 2			T E	T E					
	Possess the broad scientific knowledge, insight, and skills to analyse, model analytically and numerically, specify, design, and test experimentally, systems that are a direct application of the fundaments of physics.	T 7 E 7		T E	T E	T E	T E		T E	T E	T E
	Have a thorough understanding of the most important physical theories (logical and mathematical structure, experimental support, known physical phenomena and applications), composition of matter from subatomic to molecular and macroscopic scale, states of matter and their transitions, and semiconductors with a focus on engineering applications.	T 5 E 5			T E		T E	T E	T E		T E
	Have a thorough, in depth scientific knowledge, insight and skills in at least one of the following areas of physics or application areas: fundamental physics, nanoscale science nuclear physics and technology, physical electronics, photonics, biomedical physics, material physics.	T 3 E 3					T E		T E		T E
Scientific competences	Analyse complex problems and translate them into concrete research questions.	T 7 E 6			T E	T E	T E	T E	T	T E	T E
	Consult the scientific literature as part of the own research.	T 4 E 4				T E			T E	T E	T E
	Select and apply the appropriate models, methods and techniques.	T 6 E 6			T E	T E		T E	T E	T E	T E
	Develop and validate mathematical models and methods.	T 1 E 1		T E							
	Interpret research findings in an objective and critical manner.	T 6 E 6			T E	T E	T E		T E	T E	T E
Intellectual competences	Independently form an opinion on complex situations and problems, and defend this point of view.	T 6 E 6			T E	T E	T E		T E	T E	T E
	Apply knowledge in a creative, purposeful and innovative way to research, conceptual design and production.	T 4 E 4				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 6 E 6		T E	T E	T E		T E	T E		T E
	Stay uptodate with the evolutions in the discipline to elevate the own competences to expert level.	T 1 E 1									T E
	Readily adapt to changing professional circumstances.	T 1 E 1									T E
	Application-oriented reflecting on new physical insights and physical discoveries.	T 3 E 3			T E		T E		T E		
Competences in cooperation and communication	Have the ability to communicate in English about the own field of specialisation.	T 5 E 5			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 3 E 3				T E				T E	T E
	Have the ability to work as a member of a team in a multi disciplinary workingenvironment, as well as being capable of taking on supervisory responsibilities.	T 3 E 3				T E			T E	T E	
	Report on technical or scientific subjects verbally, in writing and using graphics.	T 5 E 5				T E	T E		T E	T E	T E
Societal competences	Act in an ethical, professional and social way.	T 3 E 3					T E			T E	T E
	Recognize the most important business and legal aspects of the own engineering discipline.	T 2 E 1							T	T E	
	Understand the historical evolution of the own engineering discipline and its social relevance.	T 4 E 4			T E		T E		T E		T E
Profession-specific competence	Master the complexity of technical systems by using system and process models.	T 2 E 2							T E		T E
	Reconcile conflicting specifications and prior conditions in a high quality and innovative concept or process.	T 5 E 5				T E	T E		T E	T E	T E
	Synthesize incomplete, contradictory or redundant data into useful information.	T 2 E 2					T E				T E
	Possess sufficient ready knowledge and understanding to evaluate the results of complex calculations, or make approximate estimates.	T 5 E 5			T E	T E	T E		T E		T E
	Pay attention to entire life cycles of systems, machines, and processes.	T 1 E 1								T E	
	Pay attention to sustainability, energyefficiency, environmental cost, use of raw materials and labour costs.	T 3 E 3					T E		T E	T E	
	Pay attention to all aspects of reliability, safety, and ergonomics.	T 1 E 1					T E				
	Have insight into and understanding of the importance of entrepreneurship.										
	Show perseverance, innovativeness, and an aptitude for creating added value.	T 5 E 5			T E	T E			T E	T E	T E

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Master of Science in Engineering Physics

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Legend:
T=teaching methods
E=evaluation methods

E026221 Plasma Physics	E002683 Mathematical Techniques for Engineers: Advanced Topics	E025010 Atomic and Molecular Physics	E022700 Computational Solutions of Wave Problems	E025600 Nuclear Physics: Principles and Applications	E029040 Physical Chemistry	E024641 Physics of Semiconductor Devices	E025700 Engineering Physics and Industry	E091103 Master's Dissertation
W 1	W 4	W 14	W 17	W 16	W 4	W 21	W 18	W 23
E 1	E 4	E 14	E 17	E 16	E 4	E 19	E 18	E 23

<< 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*			
E026221 Plasma Physics	practicum seminar	written examination report oral examination open book examination	Understand the role of plasmas in natural phenomena and technological applications. Conduct and understand simple experiments with plasmas and report on the experimental findings, both orally and in writing. Have a thorough understanding of the important physical theories in the field of plasma physics. Select and apply the proper models, methods and techniques to solve plasma physics problems.
E002683 Mathematical Techniques for Engineers: Advanced Topics	lecture seminar	written examination with open questions	Formulate the definitions, prove and apply the basic properties of Hilbert spaces and linear operators. Have a thorough understanding of the mathematical structures forming the backbone of our most important physical theories. Formulate the definitions, prove and apply the basic theorems of harmonic functions, distributions, initial and boundary value problems for ordinary and partial differential equations.
E025010 Atomic and Molecular Physics	lecture seminar: coached exercises	written examination oral examination open book examination	Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems.
E022700 Computational Solutions of Wave Problems	group work lecture	open book examination report	Students have the skills required to translate solutions of a generic wave problem to a specific discipline; to pick the most suitable computational technique for solving wave problems; to deploy finite element models in frequency domain, finite element and finite difference models in time domain; they are able to discretise boundary conditions in frequency and time domain approximations; to deploy boundary element approximations; and are able to approximate a wave problem with ray tracing techniques and to solve paraxial equations for typical situations. Students have insight into how wave problems from very different disciplines reduce to a generic problem; they recognize the important parameters for selecting a particular computational solution method; frequency domain - time domain equivalence of boundary conditions; they recognize potential and limitations of ray theory and diffraction theory; emergence of non-specular reflections on periodic and rough surfaces; range of applicability of paraxial approximation of wave problems. Students are able to take design decisions related to a large numerical project. Students have a thorough understanding of the possible computational methods for solving wave equations full wave or in approximate form.
E024641 Physics of Semiconductor Devices	guided self-study seminar: coached exercises practicum lecture	open book examination report oral examination	Thorough insight in the working principles of the building blocks (diodes, metal-semiconductor, and metal-insulator-semiconductor structures) of semiconductor devices: equilibrium, DC, AC, and large signal behavior. Critical assessment of articles from scientific literature discussing semiconductor devices. Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Recognise the most important process steps used in semiconductor device technology. Insight in the operation (equilibrium, DC, AC, and large signal) of the basic semiconductor devices: the MOSFET and the bipolar transistor including modern structures.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem Design a proof of concept Manage an innovation process and initiate creative thinking
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*			
E025010 Atomic and Molecular Physics	seminar: coached exercises	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems.
E022700 Computational Solutions of Wave Problems	group work seminar: practical PC room classes lecture	open book examination skills test	Students have the skills required to translate solutions of a generic wave problem to a specific discipline; to pick the most suitable computational technique for solving wave problems; to deploy finite element models in frequency domain, finite element and finite difference models in time domain; they are able to discretise boundary conditions in frequency and time domain approximations; to deploy boundary element approximations; and are able to approximate a wave problem with ray tracing techniques and to solve paraxial equations for typical situations. Students have insight into how wave problems from very different disciplines reduce to a generic problem; they recognize the important parameters for selecting a particular computational solution method; frequency domain - time domain equivalence of boundary conditions; they recognize potential and limitations of ray theory and diffraction theory; emergence of non-specular reflections on periodic and rough surfaces; range of applicability of paraxial approximation of wave problems. Students are able to take design decisions related to a large numerical project.

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*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E002683 Mathematical Techniques for Engineers: Advanced Topics	lecture seminar	written examination with open questions	Formulate the definitions, prove and apply the basic properties of Hilbert spaces and linear operators. Have a thorough understanding of the mathematical structures forming the backbone of our most important physical theories. Formulate the definitions, prove and apply the basic theorems of harmonic functions, distributions, initial and boundary value problems for ordinary and partial differential equations.
E025010 Atomic and Molecular Physics	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules. Application-oriented reflecting on new insights obtained by modeling of atoms and molecules.
E022700 Computational Solutions of Wave Problems	group work seminar: practical PC room classes lecture	open book examination report skills test	Students have the skills required to translate solutions of a generic wave problem to a specific discipline; to pick the most suitable computational technique for solving wave problems; to deploy finite element models in frequency domain, finite element and finite difference models in time domain; they are able to discretise boundary conditions in frequency and time domain approximations; to deploy boundary element approximations; and are able to approximate a wave problem with ray tracing techniques and to solve paraxial equations for typical situations. Students have insight into how wave problems from very different disciplines reduce to a generic problem; they recognize the important parameters for selecting a particular computational solution method; frequency domain - time domain equivalence of boundary conditions; they recognize potential and limitations of ray theory and diffraction theory; emergence of non-specular reflections on periodic and rough surfaces; range of applicability of paraxial approximation of wave problems. Students obtain the skills to cooperate and communication within small groups on an open ended problem and learn to plan a joint undertaking that takes several months. Students are able to take design decisions related to a large numerical project. Students have a thorough understanding of the possible computational methods for solving wave equations full wave or in approximate form.
E025600 Nuclear Physics: Principles and Applications	lecture	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	guided self-study seminar: coached exercises practicum lecture	oral examination report	Thorough insight in the working principles of the building blocks (diodes, metal-semiconductor, and metal-insulator-semiconductor structures) of semiconductor devices: equilibrium, DC, AC, and large signal behavior. Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Recognise the most important process steps used in semiconductor device technology. Insight in the operation (equilibrium, DC, AC, and large signal) of the basic semiconductor devices: the MOSFET and the bipolar transistor including modern structures.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem Design a proof of concept Manage an innovation process and initiate creative thinking
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*			
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E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E029040 Physical Chemistry	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To have insight in the thermodynamic and statistical meaning of entropy. Connect chemical equilibrium with reaction kinetics. Calculating enthalpy and entropy changes of physicochemical reactions in a practical context (chemical reactions, phase transitions, electrodes and charge transport). Interpret important quantities of chemical thermodynamics and their molecular background: enthalpy, entropy, free energy, chemical potential.
E024641 Physics of Semiconductor Devices	guided self-study seminar: coached exercises practicum lecture	open book examination report oral examination	Thorough insight in the working principles of the building blocks (diodes, metal-semiconductor, and metal-insulator-semiconductor structures) of semiconductor devices: equilibrium, DC, AC, and large signal behavior. Critical assessment of articles from scientific literature discussing semiconductor devices. Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Recognise the most important process steps used in semiconductor device technology. Insight in the operation (equilibrium, DC, AC, and large signal) of the basic semiconductor devices: the MOSFET and the bipolar transistor including modern 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.

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E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	guided self-study seminar: coached exercises practicum lecture	open book examination report oral examination	Thorough insight in the working principles of the building blocks (diodes, metal-semiconductor, and metal-insulator-semiconductor structures) of semiconductor devices: equilibrium, DC, AC, and large signal behavior. Critical assessment of articles from scientific literature discussing semiconductor devices. Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Recognise the most important process steps used in semiconductor device technology. Insight in the operation (equilibrium, DC, AC, and large signal) of the basic semiconductor devices: the MOSFET and the bipolar transistor including modern 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.

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E025010 Atomic and Molecular Physics	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems.
E022700 Computational Solutions of Wave Problems	group work seminar: practical PC room classes	skills test report	Students have the skills required to translate solutions of a generic wave problem to a specific discipline; to pick the most suitable computational technique for solving wave problems; to deploy finite element models in frequency domain, finite element and finite difference models in time domain; they are able to discretise boundary conditions in frequency and time domain approximations; to deploy boundary element approximations; and are able to approximate a wave problem with ray tracing techniques and to solve paraxial equations for typical situations. Students have insight into how wave problems from very different disciplines reduce to a generic problem; they recognize the important parameters for selecting a particular computational solution method; frequency domain - time domain equivalence of boundary conditions; they recognize potential and limitations of ray theory and diffraction theory; emergence of non-specular reflections on periodic and rough surfaces; range of applicability of paraxial approximation of wave problems. Students are able to take design decisions related to a large numerical project. Students have a thorough understanding of the possible computational methods for solving wave equations full wave or in approximate form.
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E029040 Physical Chemistry	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	Determine equilibrium lines on phase diagrams, and equilibrium in binary mixtures. Connect chemical equilibrium with reaction kinetics. Calculating enthalpy and entropy changes of physicochemical reactions in a practical context (chemical reactions, phase transitions, electrodes and charge transport). Interpret important quantities of chemical thermodynamics and their molecular background: enthalpy, entropy, free energy, chemical potential. To have insight in the thermodynamic and statistical meaning of entropy.
E024641 Physics of Semiconductor Devices	guided self-study practicum		Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem
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*			
E022700 Computational Solutions of Wave Problems	group work	report	Students have a thorough understanding of the possible computational methods for solving wave equations full wave or in approximate form.
E024641 Physics of Semiconductor Devices	microteaching	participation peer assessment assignment	Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem
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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E025010 Atomic and Molecular Physics	lecture seminar: coached exercises	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems.
E022700 Computational Solutions of Wave Problems	lecture	open book examination	Students have a thorough understanding of the possible computational methods for solving wave equations full wave or in approximate form.
E029040 Physical Chemistry	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	Determine equilibrium lines on phase diagrams, and equilibrium in binary mixtures. Calculating enthalpy and entropy changes of physicochemical reactions in a practical context (chemical reactions, phase transitions, electrodes and charge transport).
E024641 Physics of Semiconductor Devices	lecture practicum	open book examination report oral examination	Thorough insight in the working principles of the building blocks (diodes, metal-semiconductor, and metal-insulator-semiconductor structures) of semiconductor devices: equilibrium, DC, AC, and large signal behavior. Recognise the most important process steps used in semiconductor device technology. Insight in the operation (equilibrium, DC, AC, and large signal) of the basic semiconductor devices: the MOSFET and the bipolar transistor including modern structures.
E025700 Engineering Physics and Industry	project	oral examination report	Manage an innovation process and initiate creative thinking
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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E002683	Mathematical Techniques for Engineers: Advanced Topics	lecture seminar	written examination with open questions	Formulate the definitions, prove and apply the basic properties of Hilbert spaces and linear operators. Have a thorough understanding of the mathematical structures forming the backbone of our most important physical theories. Formulate the definitions, prove and apply the basic theorems of harmonic functions, distributions, initial and boundary value problems for ordinary and partial differential equations.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E025010 Atomic and Molecular Physics	guided self-study lecture	written examination oral examination open book examination	Application-oriented reflecting on new insights obtained by modeling of atoms and molecules. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules.
E022700 Computational Solutions of Wave Problems	group work	report	Students obtain the skills to cooperate and communication within small groups on an open ended problem and learn to plan a joint undertaking that takes several months.
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	lecture practicum microteaching	open book examination peer assessment assignment participation oral examination	Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem
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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E022700 Computational Solutions of Wave Problems	group work	report	Students are able to take design decisions related to a large numerical project.
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	microteaching	assignment peer assessment	Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem Defending a project Understand and evaluate impacts of a solution (social, economic, sustainable)
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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E022700 Computational Solutions of Wave Problems	group work	report	Students are able to take design decisions related to a large numerical project. Students obtain the skills to cooperate and communication within small groups on an open ended problem and learn to plan a joint undertaking that takes several months.
E025600 Nuclear Physics: Principles and Applications	seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem Design a proof of concept Manage an innovation process and initiate creative thinking
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*			
E002683 Mathematical Techniques for Engineers: Advanced Topics	lecture seminar	written examination with open questions	Formulate the definitions, prove and apply the basic properties of Hilbert spaces and linear operators. Have a thorough understanding of the mathematical structures forming the backbone of our most important physical theories. Formulate the definitions, prove and apply the basic theorems of harmonic functions, distributions, initial and boundary value problems for ordinary and partial differential equations.
E025010 Atomic and Molecular Physics	guided self-study lecture	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules. Application-oriented reflecting on new insights obtained by modeling of atoms and molecules.
E022700 Computational Solutions of Wave Problems	group work	report	Students obtain the skills to cooperate and communication within small groups on an open ended problem and learn to plan a joint undertaking that takes several months.
E029040 Physical Chemistry	guided self-study seminar: coached exercises lecture	written examination oral examination open book examination	To have insight in the thermodynamic and statistical meaning of entropy. Connect chemical equilibrium with reaction kinetics. Interpret important quantities of chemical thermodynamics and their molecular background: enthalpy, entropy, free energy, chemical potential.
E024641 Physics of Semiconductor Devices	microteaching	assignment peer assessment	Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Critical assessment of articles from scientific literature discussing semiconductor devices.
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*			
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*			
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*			
E025010 Atomic and Molecular Physics	guided self-study lecture	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules. Application-oriented reflecting on new insights obtained by modeling of atoms and molecules.
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	microteaching	assignment peer assessment	Critical assessment of articles from scientific literature discussing semiconductor devices.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E025010 Atomic and Molecular Physics	lecture seminar: coached exercises	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules. Application-oriented reflecting on new insights obtained by modeling of atoms and molecules.
E022700 Computational Solutions of Wave Problems	group work seminar: practical PC room classes	skills test report	Students are able to take design decisions related to a large numerical project.
E024641 Physics of Semiconductor Devices	microteaching	participation peer assessment assignment	Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Defending a project
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*			
E022700 Computational Solutions of Wave Problems	group work	report	Students are able to take design decisions related to a large numerical project.
E025700 Engineering Physics and Industry	project	oral examination report	Analyze a typical engineering physics problem Organize team work Defending a project Understand and evaluate impacts of a solution (social, economic, sustainable) Design a proof of concept Manage an innovation process and initiate creative thinking
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*			
E022700 Computational Solutions of Wave Problems	group work	report	Students are able to take design decisions related to a large numerical project.
E024641 Physics of Semiconductor Devices	microteaching	participation peer assessment assignment	Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Organize team work

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E022700 Computational Solutions of Wave Problems	group work seminar: practical PC room classes	skills test report	Students have the skills required to translate solutions of a generic wave problem to a specific discipline; to pick the most suitable computational technique for solving wave problems; to deploy finite element models in frequency domain, finite element and finite difference models in time domain; they are able to discretise boundary conditions in frequency and time domain approximations; to deploy boundary element approximations; and are able to approximate a wave problem with ray tracing techniques and to solve paraxial equations for typical situations. Students are able to take design decisions related to a large numerical project.
E025600 Nuclear Physics: Principles and Applications	guided self-study seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	guided self-study microteaching	assignment peer assessment	Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Defending a project
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*			
E025600 Nuclear Physics: Principles and Applications	lecture	written examination with open questions	Knowledge of applications of nuclear techniques.
E025700 Engineering Physics and Industry	project	oral examination report	Understand and evaluate impacts of a solution (social, economic, sustainable)
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*			
E024641 Physics of Semiconductor Devices	lecture		Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Understand and evaluate impacts of a solution (social, economic, sustainable)

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E025010 Atomic and Molecular Physics	lecture seminar: coached exercises	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules. Application-oriented reflecting on new insights obtained by modeling of atoms and molecules.
E025600 Nuclear Physics: Principles and Applications	lecture	written examination with open questions	Knowledge of applications of nuclear techniques. Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	lecture	oral examination	Thorough insight in the working principles of the building blocks (diodes, metal-semiconductor, and metal-insulator-semiconductor structures) of semiconductor devices: equilibrium, DC, AC, and large signal behavior. Recognise the most important process steps used in semiconductor device technology. Insight in the operation (equilibrium, DC, AC, and large signal) of the basic semiconductor devices: the MOSFET and the bipolar transistor including modern 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
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E024641 Physics of Semiconductor Devices	lecture practicum microteaching	open book examination report peer assessment assignment participation oral examination	Recognise the most important process steps used in semiconductor device technology. Critical assessment of articles from scientific literature discussing semiconductor devices.
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*			
E022700 Computational Solutions of Wave Problems	group work	report	Students are able to take design decisions related to a large numerical project.
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	lecture practicum	open book examination report oral examination	Thorough insight in the working principles of the building blocks (diodes, metal-semiconductor, and metal-insulator-semiconductor structures) of semiconductor devices: equilibrium, DC, AC, and large signal behavior. Critical assessment of articles from scientific literature discussing semiconductor devices. Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices. Insight in the operation (equilibrium, DC, AC, and large signal) of the basic semiconductor devices: the MOSFET and the bipolar transistor including modern structures.
E025700 Engineering Physics and Industry	project	oral examination report	Manage an innovation process and initiate creative thinking
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*			
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Insight in principles of nuclear physics. Have the skills to solve nuclear physics problems
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*			
E025010 Atomic and Molecular Physics	lecture seminar: coached exercises	written examination oral examination open book examination	Application-oriented reflecting on new insights obtained by modeling of atoms and molecules. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules.
E022700 Computational Solutions of Wave Problems	group work	open book examination report	Students are able to take design decisions related to a large numerical project.
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques. Have the skills to solve nuclear physics problems Insight in principles of nuclear physics.
E024641 Physics of Semiconductor Devices	practicum	report	Analysing semiconductor devices: drawing band diagrams, assessing IV, CV characteristics, and switching behavior, comparing competing semiconductor devices.
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.

<< **EMingwALG6.5 Pay attention to entire life cycles of systems, machines, and processes.** *Profession-specific competence*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E025700 Engineering Physics and Industry	project	oral examination report	Understand and evaluate impacts of a solution (social, economic, sustainable)

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

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques.
E024641 Physics of Semiconductor Devices	lecture	oral examination	Recognise the most important process steps used in semiconductor device technology. Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Understand and evaluate impacts of a solution (social, economic, sustainable)

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E025600 Nuclear Physics: Principles and Applications	lecture seminar: coached exercises	written examination with open questions	Knowledge of applications of nuclear techniques.

Course	Teaching methods	Evaluation methods	Course learning outcome

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

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E025010 Atomic and Molecular Physics	seminar: coached exercises	written examination oral examination open book examination	To be able to model atoms and molecules with quantum mechanical methods and to interpret atomic and molecular spectra. Be able to apply prior quantummechanical knowledge in a creative, targeted and innovative way to solve molecular and atomic many body problems. Dispose of enough knowledge and comprehension to critically evaluate the results of complex calculations of atoms and molecules. Application-oriented reflecting on new insights obtained by modeling of atoms and molecules.
E022700 Computational Solutions of Wave Problems	group work	open book examination report	Students are able to take design decisions related to a large numerical project.
E024641 Physics of Semiconductor Devices	lecture	oral examination	Recognise the most important process steps used in semiconductor device technology. Critical assessment of articles from scientific literature discussing semiconductor devices.
E025700 Engineering Physics and Industry	project	oral examination report	Manage an innovation process and initiate creative thinking Design a proof of concept
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.