Competence coverage matrix

GHENT UNIVERSITY

Master of Science in Engineering: Architecture

Architectural Design and Construction Techniques

Academic year 2021-2022

Legend:
T=teaching methods
E=evaluation methods

			General Courses					Courses Related to the Main Subject								Master's Dissertation
			E046171 Soil Mechanics	E052413 Reinforced and Prestressed Concrete	E076621 Principles of Law and Construction Law	E050942 Fire Protection of Buildings	E083940 Professional Practice: Deontology for the Architect Engineer	E051180 Building Acoustics and Lighting	E052730 Building Chemistry	E044700 Metal Constructions	E051162 Sustainable Energy Concepts for Buildings	E080070 History of Contemporary Construction: Capita Selecta	E081603 Architectural Design Studio: Design Development	E050730 Design and Techniques for Renovation of Buildings	E052271 Foundation Engineering	E091103 Master's Dissertation
Competences in one/more scientific discipline(s)	Master and apply advanced knowledge in the own engineering discipline and apply this knowledge to complex problems and designs.	T 7 E 6	T E	T E				T E				T E	T E		T	T E
	Have a profound knowledge and a critical understanding of the application of materials, structures, building components and technical installations in buildings.	T 11 E 11		T E		T E		T E	T E	T E	T E	T E	T E	T E	T E	T E
	Have a profound knowledge and a critical understanding of architectural and urban design with regard to spatial analysis, architectural typology, programme definition, figuration, design methodology and representation techniques.	T 4 E 4										T E	T E	T E		T E
	Comprehend research methods in the history and theory of architecture and urbanism.	T 3 E 3										T E		T E		T E
	Know the procedural, legal and deontological aspects of architecture and urban planning.	T 2 E 2			T E		T E									
	Have a critical understanding of standard problems and calculation methods in architectural engineering.	T 8 E 7		T E				T E		T E	T E	T E	T E	T	T E	
	Have a thorough knowledge and critical understanding of the application areas and methods in the field of urban design, urbanism and spatial planning.															
Scientific competences	Analyse complex problems and translate them into concrete research questions.	T 6 E 6						T E		T E		T E	T E		T E	T E
	Consult the scientific literature as part of the own research.	T 3 E 3					T E					T E				T E
	Select and apply the appropriate models, methods and techniques.	T 8 E 8		T E				T E		T E		T E	T E	T E	T E	T E
	Interpret research findings in an objective and critical manner.	T 4 E 3										T E	T	T E		T E
	Independently develop solutions for complex design problems in a wide range of application areas and scales based on design research.	T 4 E 3											T E	T E	T E	T E
	Organise complex design processes and apply acquired knowledge and advanced design tools in an effective and creative way in the different stages of the design.	T 3 E 2											T	T E		T E
Intellectual competences	Develop an opinion about complex situations in an independent way and report this both orally, graphically and in writing in an academic correct way.	T 4 E 4										T E		T E	T E	T E
	Apply knowledge in a creative, purposeful and innovative way to research, conceptual design and production.	T 5 E 5										T E	T E	T E	T E	T E
	Reflect critically and independently on own design proposals, based on the scientific, historical and social knowledge acquired.	T 3 E 3											T E	T E		T E
	Make detailed and sound design decisions within the inherent complexity and uncertainty of architectural design, and evaluate these decisions constantly during the design process.	T 6 E 6		T E				T E					T E	T E	T E	T E
	Develop a consistent learning path within the courses offered in order to broaden and/or deepen individual fields of interest and expertise.	T 5 E 3				T E							T	T E	T	T E
Competences in cooperation and communication	Project management: have the ability to formulate objectives, report efficiently, keep track of targets, progress of the project,...	T 3 E 3										T E			T E	T E
	Ability to work as a member of a (design) team in a multi-disciplinary working-environment.	T 2 E 1						T						T E		
	Present and defend own research and design results to a public in a systematic and clear way.	T 3 E 3										T E		T E		T E
Societal competences	Include social aspects of architecture, urbanism and building to the own work.	T 3 E 1			T		T									T E
	Include the life cycle and environmental impact of the built environment to the own work.	T 6 E 4			T E		T	T			T E			T E		T E
	Include safety and accessibility in the built environment to the own work.	T 5 E 4			T E	T E				T				T E		T E
			W 1 E 1	W 5 E 5	W 4 E 3	W 3 E 3	W 4 E 2	W 8 E 6	W 1 E 1	W 5 E 4	W 3 E 3	W 13 E 13	W 13 E 9	W 17 E 16	W 11 E 9	W 20 E 20

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E046171 Soil Mechanics	lecture seminar: coached exercises	written examination with open questions	The student identifies the physical, hydraulic and mechanical properties of different types of soils. The student designs a shallow or deep foundation for a simple construction project. The student interprets the measurement data of laboratory and in-situ soil investigation.
E052413 Reinforced and Prestressed Concrete	lecture seminar: coached exercises	written examination oral examination	Analyse the force transfer in disturbed regions by means of strut-and-tie models. Justify the proposed solution. Selection of the dimensions of linear concrete members and calculation of the required reinforcement areas based on the internal forces in the ultimate limit state. Have insight in the general design philosophy of concrete structures in the framework of the semi-probabilistic safety format. Identify and characterize the relevant limit states. Practical evaluation of concrete stresses, crack widths and deflections in the serviceability limit states. Develop the moment-curvature relationship of reinforced concrete sections as a tool for the prediction of the deformation behaviour of linear elements including the time-dependent aspects. Substantiate the ultimate behaviour of linear reinforced concrete members (columns and beams) submitted to compression, bending, compound bending, shear and torsion by means of appropriate design models. Assessmentof the load-bearing capacity of existing concrete structures by checking the relevant ultimate limit states. Elucidate the interaction mechanisms between reinforcement and concrete (equivalent concrete section, bond, cracking, anchorage).
E051180 Building Acoustics and Lighting	lecture seminar	written examination assignment	design artificial lighting to achieve visual comfort understand the problems, assessment methods and terminology of noise control in buildings apply construction technology to improve the acoustical performance of a building in the design stage understand the principles of visual comfort and lighting technology
E080070 History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E081603 Architectural Design Studio: Design Development	seminar	assignment	
E052271 Foundation Engineering	lecture seminar: coached exercises		SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations
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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E050942 Fire Protection of Buildings	excursion lecture	open book examination oral examination	To gain insight into the fire safety aspects to consider during the design and construction process of buildings: active and passive fire protection, evacuation and Fire Safety Engineering To gain insight in the dynamics of smoke and fire in the built environment.
E051180 Building Acoustics and Lighting	lecture seminar	written examination assignment	design artificial lighting to achieve visual comfort understand the problems, assessment methods and terminology of noise control in buildings apply construction technology to improve the acoustical performance of a building in the design stage understand the principles of visual comfort and lighting technology
E052730 Building Chemistry	lecture	written examination with open questions written examination	Knowledge of the corrosion behavior of metals Knowledge of the chemical properties of synthetic organic polymeric construction materials Knowledge of the chemical properties of bituminous materials Knowledge of the chemical properties of inorganic polymeric construction materials
E044700 Metal Constructions	lecture seminar: coached exercises	written examination open book examination	To be able to design simple connections with welds or bolts. Being able to design an ordinary steel construction so that the strength conditions in the cross-sections are fulfilled (except for instability phenomena that are taught in the course "Structural Analysis III").
E051162 Sustainable Energy Concepts for Buildings	excursion practicum lecture	oral examination report assignment	Ability to understand and apply the design and operational principles of HVAC-systems in buildings. To be able to assess and optimize the performances of HVAC in relation to IEQ and sustainability. Good knowledge of the interaction of building and installation design.
E080070 History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E081603 Architectural Design Studio: Design Development	seminar	assignment	
E050730 Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises fieldwork	written examination	
E052271 Foundation Engineering	lecture seminar: coached exercises	oral examination	SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations
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.

<< **EMingwARCH1.3 Have a profound knowledge and a critical understanding of architectural and urban design with regard to spatial analysis, architectural typology, programme definition, figuration, design methodology and representation techniques.** *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*				
E080070	History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E081603	Architectural Design Studio: Design Development	seminar	assignment	
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
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*				
E080070	History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
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*				
E076621	Principles of Law and Construction Law	lecture lecture: response lecture	oral examination	The student understands principles of insurance and damages. The student is able to use the relevant sources. The student can situate contracting law within the general contracting law. The student can apply the concepts to a case. The student knows the procedures for government issued tendering.
E083940	Professional Practice: Deontology for the Architect Engineer	excursion lecture	oral examination	To gain insight into the practical aspects of the architect's profession

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E052413 Reinforced and Prestressed Concrete	lecture seminar: coached exercises	written examination oral examination	Analyse the force transfer in disturbed regions by means of strut-and-tie models. Justify the proposed solution. Selection of the dimensions of linear concrete members and calculation of the required reinforcement areas based on the internal forces in the ultimate limit state. Have insight in the general design philosophy of concrete structures in the framework of the semi-probabilistic safety format. Identify and characterize the relevant limit states. Practical evaluation of concrete stresses, crack widths and deflections in the serviceability limit states. Develop the moment-curvature relationship of reinforced concrete sections as a tool for the prediction of the deformation behaviour of linear elements including the time-dependent aspects. Substantiate the ultimate behaviour of linear reinforced concrete members (columns and beams) submitted to compression, bending, compound bending, shear and torsion by means of appropriate design models. Assessmentof the load-bearing capacity of existing concrete structures by checking the relevant ultimate limit states. Elucidate the interaction mechanisms between reinforcement and concrete (equivalent concrete section, bond, cracking, anchorage).
E051180 Building Acoustics and Lighting	lecture seminar	written examination assignment	design artificial lighting to achieve visual comfort understand the problems, assessment methods and terminology of noise control in buildings apply construction technology to improve the acoustical performance of a building in the design stage understand the principles of visual comfort and lighting technology
E044700 Metal Constructions	lecture seminar: coached exercises	written examination open book examination	To be able to design simple connections with welds or bolts. Being able to design an ordinary steel construction so that the strength conditions in the cross-sections are fulfilled (except for instability phenomena that are taught in the course "Structural Analysis III").
E051162 Sustainable Energy Concepts for Buildings	excursion practicum lecture	oral examination report assignment	Ability to understand and apply the design and operational principles of HVAC-systems in buildings. To be able to assess and optimize the performances of HVAC in relation to IEQ and sustainability. Good knowledge of the interaction of building and installation design.
E080070 History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E081603 Architectural Design Studio: Design Development	seminar	assignment	
E050730 Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork		
E052271 Foundation Engineering	lecture seminar: coached exercises	oral examination	SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations

<< **EMingwARCH1.7 Have a thorough knowledge and critical understanding of the application areas and methods in the field of urban design, urbanism and spatial planning.** *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*

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E051180 Building Acoustics and Lighting	lecture seminar	written examination assignment	design artificial lighting to achieve visual comfort understand the problems, assessment methods and terminology of noise control in buildings apply construction technology to improve the acoustical performance of a building in the design stage understand the principles of visual comfort and lighting technology
E044700 Metal Constructions	lecture seminar: coached exercises	written examination open book examination	To be able to design simple connections with welds or bolts. Being able to design an ordinary steel construction so that the strength conditions in the cross-sections are fulfilled (except for instability phenomena that are taught in the course "Structural Analysis III").
E080070 History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
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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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E080070	History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
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E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
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E080070	History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
E052271	Foundation Engineering	lecture seminar: coached exercises	oral examination	SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations
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*				
E080070	History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E081603	Architectural Design Studio: Design Development	seminar	assignment	
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
E052271	Foundation Engineering	lecture seminar: coached exercises	oral examination	SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations
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*				
E081603	Architectural Design Studio: Design Development	seminar	assignment	
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
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*			
E052413 Reinforced and Prestressed Concrete	lecture seminar: coached exercises	written examination oral examination	Analyse the force transfer in disturbed regions by means of strut-and-tie models. Justify the proposed solution. Selection of the dimensions of linear concrete members and calculation of the required reinforcement areas based on the internal forces in the ultimate limit state. Have insight in the general design philosophy of concrete structures in the framework of the semi-probabilistic safety format. Identify and characterize the relevant limit states. Practical evaluation of concrete stresses, crack widths and deflections in the serviceability limit states. Develop the moment-curvature relationship of reinforced concrete sections as a tool for the prediction of the deformation behaviour of linear elements including the time-dependent aspects. Substantiate the ultimate behaviour of linear reinforced concrete members (columns and beams) submitted to compression, bending, compound bending, shear and torsion by means of appropriate design models. Assessmentof the load-bearing capacity of existing concrete structures by checking the relevant ultimate limit states. Elucidate the interaction mechanisms between reinforcement and concrete (equivalent concrete section, bond, cracking, anchorage).
E051180 Building Acoustics and Lighting	lecture seminar	written examination assignment	design artificial lighting to achieve visual comfort understand the problems, assessment methods and terminology of noise control in buildings apply construction technology to improve the acoustical performance of a building in the design stage understand the principles of visual comfort and lighting technology
E081603 Architectural Design Studio: Design Development	seminar	assignment	
E050730 Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
E052271 Foundation Engineering	lecture seminar: coached exercises	oral examination	SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations
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 vooraf gegaan door ** werden niet teruggevonden in de studiefiche*				
E050942	Fire Protection of Buildings	excursion lecture	open book examination oral examination	To gain insight into the fire safety aspects to consider during the design and construction process of buildings: active and passive fire protection, evacuation and Fire Safety Engineering To gain insight in the dynamics of smoke and fire in the built environment.
E081603	Architectural Design Studio: Design Development	seminar		
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
E052271	Foundation Engineering	lecture seminar: coached exercises		SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations
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*			
E080070 History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E052271 Foundation Engineering	lecture seminar: coached exercises	oral examination	SKILLS: design of foundations; to be able to find the right solution for a well defined case; to judge a proposed foundation design; to evaluate possible solutions; to consider the different solutions UNDERSTANDINGS: shallow foundations, pile foundations, improvement of existing foundations, soil stresses, stability of soil retaining structures; special foundation techniques INSIGHTS: different types of construction of foundations + influence on bearing capacity; knowledge of practical methods for the solutions for foundation problems with attention to the problems dealing with project planning; the importance of a good soil retaining structure and the influence on the environment; different solutions for problems dealing with classic shallow and deep foundations
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*				
E051180	Building Acoustics and Lighting	lecture seminar		design artificial lighting to achieve visual comfort understand the problems, assessment methods and terminology of noise control in buildings apply construction technology to improve the acoustical performance of a building in the design stage understand the principles of visual comfort and lighting technology
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E080070	History of Contemporary Construction: Capita Selecta	lecture self-reliant study activities	oral examination report	being able to show insight in the course material being able to present the developed insights, using established academic presentation formats being able to develop a personal and critical reflection on the discussed themes and to trace and collect the necessary sources to underpin this reflection
E050730	Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
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*				
E076621	Principles of Law and Construction Law	lecture lecture: response lecture		The student understands principles of insurance and damages. The student is able to use the relevant sources. The student can situate contracting law within the general contracting law. The student can apply the concepts to a case. The student knows the procedures for government issued tendering.
E083940	Professional Practice: Deontology for the Architect Engineer	excursion lecture		To gain insight into the practical aspects of the architect's profession
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*			
E076621 Principles of Law and Construction Law	lecture lecture: response lecture	oral examination	The student understands principles of insurance and damages. The student is able to use the relevant sources. The student can situate contracting law within the general contracting law. The student can apply the concepts to a case. The student knows the procedures for government issued tendering.
E083940 Professional Practice: Deontology for the Architect Engineer	excursion lecture		To gain insight into the practical aspects of the architect's profession
E051180 Building Acoustics and Lighting	lecture seminar		design artificial lighting to achieve visual comfort understand the problems, assessment methods and terminology of noise control in buildings apply construction technology to improve the acoustical performance of a building in the design stage understand the principles of visual comfort and lighting technology
E051162 Sustainable Energy Concepts for Buildings	excursion practicum lecture	oral examination report assignment	Ability to understand and apply the design and operational principles of HVAC-systems in buildings. To be able to assess and optimize the performances of HVAC in relation to IEQ and sustainability. Good knowledge of the interaction of building and installation design.
E050730 Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
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*			
E076621 Principles of Law and Construction Law	lecture lecture: response lecture	oral examination	The student understands principles of insurance and damages. The student is able to use the relevant sources. The student can situate contracting law within the general contracting law. The student can apply the concepts to a case. The student knows the procedures for government issued tendering.
E050942 Fire Protection of Buildings	excursion lecture	open book examination oral examination	To gain insight into the fire safety aspects to consider during the design and construction process of buildings: active and passive fire protection, evacuation and Fire Safety Engineering
E044700 Metal Constructions	lecture		To be able to design simple connections with welds or bolts. Being able to design an ordinary steel construction so that the strength conditions in the cross-sections are fulfilled (except for instability phenomena that are taught in the course "Structural Analysis III").
E050730 Design and Techniques for Renovation of Buildings	lecture seminar: coached exercises seminar fieldwork	written examination	
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.