Competence coverage matrix

GHENT UNIVERSITY

Master of Science in Fire Safety Engineering

Academic year 2021-2022

Legend:
T=teaching methods
E=evaluation methods

			General Courses																		Master's Dissertation
			E051540 Explosions and Industrial Fire Safety	E051421 Fluid Mechanics Applications in Fire	E051482 Active Fire Protection I: Detection and Suppression	E051494 Active Fire Protection II: Smoke and Heat Control	E051700 CFD for Fire Safety Engineering	E051443 Fire Safety and Legislation	E051610 Passive Fire Protection	E061522 Performance-Based Design	E051630 Fire Safety Strategy Project	E051430 Fire Dynamics	E051581 Fire Research Seminar	E039161 Thermodynamics, Heat and Mass Transfer	E051570 Material Behaviour at Ambient and Elevated Temperatures	E051461 Interaction between People and Fire	E051550 Risk Management	E051590 Compartmentation Strategies	E051600 Structural Fire Engineering	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 13 E 13	T E	T E	T E	T E	T E		T E	T E	T E			T E		T E	T E	T E			T E
	Apply Computer Aided Engineering (CAE) tools and advanced communication instruments in a creative and purposeful way.	T 6 E 5				T E	T E			T E	T E					T E	T			
	Master and apply knowledge of physics, chemistry, thermodynamics, heat and mass transfer, fluid mechanics and computational fluid dynamics to critically analyse and evaluate the development of fires in enclosures.	T 8 E 8		T E			T E			T E	T E	T E		T E	T E						T E
	Master and apply knowledge of structural fire engineering to critically analyse, design and evaluate the performance of structures in case of fire.	T 5 E 5							T E	T E	T E									T E	T E
	Master and apply knowledge of explosions to critically analyse and evaluate the associated risk.	T 4 E 4	T E							T E							T E				T E
	Master and apply the advanced knowledge of fire dynamics, risk assessment, human behaviour, passive fire protection systems and active fire protection systems.	T 9 E 9			T E	T E				T E	T E	T E			T E	T E	T E	T E				T E
	Master and apply the principles necessary to develop a performance-based fire safety design.	T 7 E 7								T E	T E	T E				T E	T E			T E	T E
Scientific competences	Analyse complex problems and translate them into concrete research questions.	T 10 E 10	T E		T E	T E			T E	T E			T E	T E		T E	T E				T E
	Consult the scientific literature as part of the own research.	T 7 E 7								T E	T E		T E			T E	T E	T E			T E
	Select and apply the appropriate models, methods and techniques.	T 12 E 12	T E	T E	T E	T E	T E			T E	T E		T E		T E	T E	T E				T E
	Develop and validate mathematical models and methods.	T 3 E 3								T E						T E	T E				
	Interpret research findings in an objective and critical manner.	T 7 E 7				T E	T E			T E			T E			T E	T E				T E
	Elaborate problems of fire risk assessment in a critical, autonomous and flexible manner with a limited amount of data.	T 4 E 4	T E							T E							T E				T E
	Perform valid computer simulations of development and consequences of enclosure fires.	T 6 E 6				T E	T E			T E	T E					T E					T E
	Perform valid computer simulations to assess the performance of smoke and heat control systems as means of active fire protection measure.	T 4 E 4				T E				T E	T E										T E
	Perform valid computer simulations of the behaviour of structural systems in case of fire.	T 3 E 3									T E									T E	T E
Intellectual competences	Independently form an opinion on complex situations and problems, and defend this point of view.	T 13 E 13	T E	T E	T E	T E	T E			T E	T E		T E	T E		T E	T E	T E			T E
	Apply knowledge in a creative, purposeful and innovative way to research, conceptual design and production.	T 8 E 8	T E		T E	T E				T E	T E					T E	T E				T E
	Critically reflect on one's own way of thinking and acting, and understand the limits of one's competences.	T 10 E 10	T E	T E	T E	T E	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 7 E 7	T E		T E		T E	T E		T E						T E					T E
	Readily adapt to changing professional circumstances.	T 3 E 3	T E							T E											T E
	Develop scientifically sound arguments to optimize passive and active fire protection measures.	T 10 E 10			T E	T E			T E	T E	T E				T E	T E	T E	T E			T E
	Develop scientifically sound arguments to develop a performance-based fire safety design.	T 6 E 6								T E	T E					T E	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 14 E 14	T E	T E	T E	T E	T E			T E	T E	T E	T E			T E	T E	T E	T E	T E	T E
	Project management: have the ability to formulate objectives, report efficiently, keep track of targets, follow the progress of the project,...	T 8 E 8			T E	T E				T E	T E		T E			T E			T E	T E
	Have the ability to work as a member of a team in a multi disciplinary workingenvironment, as well as being capable of taking on supervisory responsibilities.	T 6 E 6			T E	T E				T E	T E					T E	T E				
	Report on technical or scientific subjects verbally, in writing and using graphics.	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	T E
	Function in an international environment (students, PhD students, scientific co-workers, scholars).	T 8 E 8				T E				T E	T E		T E			T E	T E	T E			T E
Societal competences	Act in an ethical, professional and social way.	T 9 E 9	T E	T E	T E	T E	T E			T E	T E						T E				T E
	Recognize the most important business and legal aspects of the own engineering discipline.	T 3 E 3	T E			T E				T E											
	Understand the historical evolution of the own engineering discipline and its social relevance.	T 4 E 3								T E						T E	T				T E
	Master and apply critical insight in existing fire safety legislation and regulations in the development of a fire safety design.	T 10 E 10	T E			T E		T E		T E	T E					T E	T E	T E	T E	T E	T E
	Act in an ethical, professional and social way when developing and presenting a performance based fire safety design.	T 5 E 5				T E				T E	T E						T E				T E

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Legend:
T=teaching methods
E=evaluation methods

			E051540 Explosions and Industrial Fire Safety	E051421 Fluid Mechanics Applications in Fire	E051482 Active Fire Protection I: Detection and Suppression	E051494 Active Fire Protection II: Smoke and Heat Control	E051700 CFD for Fire Safety Engineering	E051443 Fire Safety and Legislation	E051610 Passive Fire Protection	E061522 Performance-Based Design	E051630 Fire Safety Strategy Project	E051430 Fire Dynamics	E051581 Fire Research Seminar	E039161 Thermodynamics, Heat and Mass Transfer	E051570 Material Behaviour at Ambient and Elevated Temperatures	E051461 Interaction between People and Fire	E051550 Risk Management	E051590 Compartmentation Strategies	E051600 Structural Fire Engineering	E091103 Master's Dissertation
Profession-specific competence	Master the complexity of technical systems by using system and process models.	T 7 E 7	T E	T E		T E	T E			T E							T E			T E
	Reconcile conflicting specifications and prior conditions in a high quality and innovative concept or process.	T 5 E 5	T E		T E					T E							T E			T E
	Synthesize incomplete, contradictory or redundant data into useful information.	T 8 E 8	T E		T E	T E				T E			T E			T E	T E			T E
	Possess sufficient ready knowledge and understanding to evaluate the results of complex calculations, or make approximate estimates.	T 9 E 8	T E	T E	T E	T E	T E			T E	T E						T			T E
	Pay attention to entire life cycles of systems, machines, and processes.	T 3 E 3	T E		T E					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 3 E 3			T E					T E							T E			
	Have insight into and understanding of the importance of entrepreneurship.	T 2 E 2								T E	T E									
	Show perseverance, innovativeness, and an aptitude for creating added value.	T 7 E 7		T E	T E	T E				T E							T E	T E		T E
	Integrate Fire Safety Engineering related knowledge to develop a performance-based fire safety design.	T 7 E 7					T E			T E	T E					T E	T E		T E	T E
			W 19 E 19	W 12 E 12	W 20 E 20	W 25 E 25	W 15 E 15	W 2 E 2	W 5 E 5	W 42 E 42	W 27 E 27	W 4 E 4	W 10 E 10	W 4 E 4	W 4 E 4	W 24 E 24	W 30 E 27	W 10 E 10	W 9 E 9	W 35 E 35

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

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

Course	Teaching methods	Evaluation methods	Course learning outcome
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	lecture seminar project	open book examination report oral examination	Make a critical assessment of the different manual suppression systems and automatic suppression methods for different incident types, by means of calculations and technical considerations. Make a critical assessment, by means of calculations and technical considerations, of different fire detection methods. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture seminar: coached exercises project	written examination report oral examination open book examination	Perform a critical evaluation of a smoke and heat control system design Compute and critically evaluate the removal of heat from an enclosure Make a correct CFD calculation in the context of a smoke and heat control system design Explain the processes involved in the production of smoke in case of fire Compute and critically evaluate the movement of smoke inside, into and out of an enclosure Calculate an original design of smoke and heat control systems for a realistic configuration Apply national and international standards and regulative documents for the design of smoke control systems
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E051610 Passive Fire Protection	lecture online lecture seminar: coached exercises	written examination	Classify a building product based on test results Analyse a construction detail for passive fire protection systems Give an overview of fire protection systems possible for different applications, including their respective advantages and disadvantages
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions report assignment participation	Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design. Knowledge: Use functional criteria (performance) as a criterion in order to realise and evaluate an original fire safety design. Knowledge: Evaluate self-reliantly the fire risk in a project. Skills: Analyse own results and results of others within fire performance based designs in an objective manner.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …

E039161 Thermodynamics, Heat and Mass Transfer	lecture seminar: coached exercises	written examination oral examination	Understand and calculate the consequences of heat transfer in case of fire. Quantify thermodynamic properties of pure substances and mixtures. Solve a new complex problem, involving the thermodynamic processes and the different modes of heat transfer that occur in case of fire. Understand the mathematical formulation of the physical processes of heat transfer. Understand the thermodynamic aspects of combustion. Recognize the occurrence of mass transfer in case of fire. Calculate flue gas temperature and composition in case of combustion. Understand and apply the first law of thermodynamics.
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Explain the nature of likely human behaviour associated with evacuation in fire situations. Be aware of the limitations of evacuation modelling. Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	lecture project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to analyse system behaviour and construct fault, event and decision trees
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
E091103 Master's Dissertation	master's dissertation	oral examination assignment	Define, study and analyse the research problem in a specific domain. Give proof of independency, motivation, dedication, drive to innovation and creativity, initiative and perseverance. Self-assessment with adequate and critical self-correction and objectivity. Communicate adequately on the research, the results and problems, present and found them, both to colleagues as to laypeople. Render and synthesise the results concisely. Critically analyse, formulate, study, execute and/or process different aspects in the execution of research (literature search, topical study, research and the reflection on the research, experiments, experimentations, designs, simulations, results, conclusions,…). Find an appropriate methodology, in accordance with the applicable scientific norms of the specific field of study.

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

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E051494 Active Fire Protection II: Smoke and Heat Control	project	open book examination report oral examination	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work	report	Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Identify appropriate human performance data that can be used in evacuation analysis associated with fire. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner. Be aware of the limitations of evacuation modelling.
E051550 Risk Management	lecture seminar project		Being able to execute simple reliability analyses of level 2 and 3 Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions report assignment participation	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Attitudes: Reflect on own way of thinking and acting. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Knowledge: Use functional criteria (performance) as a criterion in order to realise and evaluate an original fire safety design. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Be aware of on-going evolutions in the field of interest. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Be aware of the own expertise and improve to expert level. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design. Skills: Determine the uncertainties in the design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051430 Fire Dynamics	lecture seminar: coached exercises	written examination oral examination	Analyse fire dynamics in an enclosure.
E039161 Thermodynamics, Heat and Mass Transfer	lecture seminar: coached exercises	written examination oral examination	Understand and calculate the consequences of heat transfer in case of fire. Solve a new complex problem, involving the thermodynamic processes and the different modes of heat transfer that occur in case of fire. Recognize the occurrence of mass transfer in case of fire.
E051570 Material Behaviour at Ambient and Elevated Temperatures	lecture lecture: plenary exercises	oral examination	Recommend materials as function of the requested application Know, compare and interpret in a critical manner the temperature dependent properties of different materials
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*			
E051610 Passive Fire Protection	lecture online lecture seminar: coached exercises	written examination	Classify a building product based on test results Analyse a construction detail for passive fire protection systems Give an overview of fire protection systems possible for different applications, including their respective advantages and disadvantages
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Attitudes: Reflect on own way of thinking and acting. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Knowledge: Use functional criteria (performance) as a criterion in order to realise and evaluate an original fire safety design. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Be aware of the own expertise and improve to expert level. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design. Skills: Determine the uncertainties in the design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051600 Structural Fire Engineering	lecture lecture: response lecture seminar: coached exercises	oral examination assignment participation	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E061522 Performance-Based Design	group work self-reliant study activities project lecture	report	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Knowledge: Use functional criteria (performance) as a criterion in order to realise and evaluate an original fire safety design. Knowledge: Evaluate self-reliantly the fire risk in a project. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Be aware of the own expertise and improve to expert level. Skills: Determine the uncertainties in the design.
E051550 Risk Management	lecture project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to analyse system behaviour and construct fault, event and decision trees
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*			
E051482 Active Fire Protection I: Detection and Suppression	lecture seminar project	open book examination report oral examination	Make a critical assessment of the different manual suppression systems and automatic suppression methods for different incident types, by means of calculations and technical considerations. Make a critical assessment, by means of calculations and technical considerations, of different fire detection methods. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture seminar: coached exercises project	written examination report oral examination open book examination	Perform a critical evaluation of a smoke and heat control system design Compute and critically evaluate the removal of heat from an enclosure Make a correct CFD calculation in the context of a smoke and heat control system design Explain the processes involved in the production of smoke in case of fire Compute and critically evaluate the movement of smoke inside, into and out of an enclosure Calculate an original design of smoke and heat control systems for a realistic configuration
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions report assignment participation	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Attitudes: Reflect on own way of thinking and acting. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Knowledge: Use functional criteria (performance) as a criterion in order to realise and evaluate an original fire safety design. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Be aware of on-going evolutions in the field of interest. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Be aware of the own expertise and improve to expert level. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design. Skills: Determine the uncertainties in the design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051430 Fire Dynamics	lecture seminar: coached exercises	written examination oral examination	Analyse fire dynamics in an enclosure.
E051570 Material Behaviour at Ambient and Elevated Temperatures	lecture lecture: plenary exercises	oral examination	Understand testing methods to determine properties of materials Know, compare and interpret in a critical manner the temperature dependent properties of different materials Recommend materials as function of the requested application
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Explain the nature of likely human behaviour associated with evacuation in fire situations. Be aware of the limitations of evacuation modelling. Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	lecture seminar project	written examination report oral examination	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
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*			
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions report assignment participation	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Attitudes: Reflect on own way of thinking and acting. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Knowledge: Use functional criteria (performance) as a criterion in order to realise and evaluate an original fire safety design. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Be aware of on-going evolutions in the field of interest. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Be aware of the own expertise and improve to expert level. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design. Skills: Determine the uncertainties in the design.
E051630 Fire Safety Strategy Project	project	participation assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051430 Fire Dynamics	lecture	oral examination	Analyse fire dynamics in an enclosure.
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Critically assess an evacuation analysis performed using evacuation modelling tools. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner. Be aware of the limitations of evacuation modelling. Identify appropriate human performance data that can be used in evacuation analysis associated with fire. Critically assess the suitability of various evacuation modelling tools.
E051550 Risk Management	lecture seminar project	written examination report oral examination	Being able to execute simple reliability analyses of level 2 and 3 Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
E051600 Structural Fire Engineering	lecture lecture: response lecture seminar: coached exercises	oral examination assignment participation	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051482 Active Fire Protection I: Detection and Suppression	lecture seminar project	open book examination report oral examination	Make a critical assessment of the different manual suppression systems and automatic suppression methods for different incident types, by means of calculations and technical considerations. Make a critical assessment, by means of calculations and technical considerations, of different fire detection methods. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture seminar: coached exercises project	written examination report oral examination open book examination	Calculate an original design of smoke and heat control systems for a realistic configuration Compute and critically evaluate the removal of heat from an enclosure Make a correct CFD calculation in the context of a smoke and heat control system design Compute and critically evaluate the movement of smoke inside, into and out of an enclosure
E051610 Passive Fire Protection	lecture online lecture seminar: coached exercises	written examination	Analyse a construction detail for passive fire protection systems
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions	Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Knowledge: Evaluate self-reliantly the fire risk in a project.
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	assignment job performance assessment	Report in a structured and scientific manner, using appropriate language Perform a comprehensive literature study on a specified fire related topic, including scientific referencing Schedule work on a dedicated project, plan ahead and report intermediate steps
E039161 Thermodynamics, Heat and Mass Transfer	lecture seminar: coached exercises	written examination oral examination	Understand the mathematical formulation of the physical processes of heat transfer. Solve a new complex problem, involving the thermodynamic processes and the different modes of heat transfer that occur in case of fire.
E051461 Interaction between People and Fire	lecture	report	Explain the nature of likely human behaviour associated with evacuation in fire situations. Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	lecture seminar project	oral examination report	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
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*			
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Attitudes: Be aware of the own expertise and improve to expert level. Attitudes: Reflect on own way of thinking and acting. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Be aware of on-going evolutions in the field of interest. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering.
E051630 Fire Safety Strategy Project	project	participation assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	assignment	Report in a structured and scientific manner, using appropriate language Perform a comprehensive literature study on a specified fire related topic, including scientific referencing Present to audiences with different backgrounds
E051461 Interaction between People and Fire	lecture	report	Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	lecture seminar project	open book examination report oral examination	Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Design, together with colleagues, a fire detection installation for a building.
E051494 Active Fire Protection II: Smoke and Heat Control	project	open book examination report oral examination	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Determine the uncertainties in the design. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051581 Fire Research Seminar	lecture: plenary exercises	oral examination assignment	Perform a systematic data analysis.
E051570 Material Behaviour at Ambient and Elevated Temperatures	lecture lecture: plenary exercises	oral examination	Understand testing methods to determine properties of materials Know, compare and interpret in a critical manner the temperature dependent properties of different materials Recommend materials as function of the requested application
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Critically assess the suitability of various evacuation modelling tools. Be aware of the limitations of evacuation modelling. Identify appropriate human performance data that can be used in evacuation analysis associated with fire.
E051550 Risk Management	lecture seminar project	written examination report oral examination	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
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*			
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Make and evaluate approximate estimates in a design. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models.
E051461 Interaction between People and Fire	lecture	report	Explain the nature of likely human behaviour associated with evacuation in fire situations. Be aware of the limitations of evacuation modelling. Identify appropriate human performance data that can be used in evacuation analysis associated with fire. Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	lecture seminar project	written examination report oral examination	Being able to execute simple reliability analyses of level 2 and 3 Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations

Course	Teaching methods	Evaluation methods	Course learning outcome
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E051494 Active Fire Protection II: Smoke and Heat Control	project	open book examination report oral examination	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Determine the uncertainties in the design. Attitudes: Reflect on own way of thinking and acting. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues. Skills: Make and evaluate approximate estimates in a design. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Be aware of the own expertise and improve to expert level.
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	assignment job performance assessment	Report in a structured and scientific manner, using appropriate language Perform a comprehensive literature study on a specified fire related topic, including scientific referencing Schedule work on a dedicated project, plan ahead and report intermediate steps Present to audiences with different backgrounds
E051461 Interaction between People and Fire	lecture	report	Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	project	oral examination report	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Skills: Determine the uncertainties in the design.
E051550 Risk Management	project seminar	written examination report oral examination	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to analyse system behaviour and construct fault, event and decision trees
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*			
E051494 Active Fire Protection II: Smoke and Heat Control	lecture project	open book examination report oral examination	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	assignment report	Skills: Determine the uncertainties in the design. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051461 Interaction between People and Fire	lecture project	report	Critically assess an evacuation analysis performed using evacuation modelling tools. Be aware of the limitations of evacuation modelling. Critically assess the suitability of various evacuation modelling tools.
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*			
E051494 Active Fire Protection II: Smoke and Heat Control	lecture project	open book examination report oral examination	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E061522 Performance-Based Design	group work self-reliant study activities project lecture	assignment report	Skills: Determine the uncertainties in the design. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
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*			
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051600 Structural Fire Engineering	seminar: coached exercises	participation assignment	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture project	open book examination report oral examination	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration Apply national and international standards and regulative documents for the design of smoke control systems
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Determine the uncertainties in the design. Attitudes: Reflect on own way of thinking and acting. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Be aware of the own expertise and improve to expert level.
E051630 Fire Safety Strategy Project	demonstration project	oral examination peer assessment participation	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	oral examination job performance assessment assignment	Report in a structured and scientific manner, using appropriate language Perform a comprehensive literature study on a specified fire related topic, including scientific referencing Schedule work on a dedicated project, plan ahead and report intermediate steps Present to audiences with different backgrounds
E039161 Thermodynamics, Heat and Mass Transfer	lecture seminar: coached exercises	written examination oral examination	Solve a new complex problem, involving the thermodynamic processes and the different modes of heat transfer that occur in case of fire.
E051461 Interaction between People and Fire	lecture	report	Explain the nature of likely human behaviour associated with evacuation in fire situations. Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	project	oral examination report	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture project	open book examination report oral examination	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design. Attitudes: Reflect on own way of thinking and acting. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Be aware of on-going evolutions in the field of interest. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Skills: Discuss performance based design in the English language. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk.
E051630 Fire Safety Strategy Project	project	participation assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051461 Interaction between People and Fire	lecture	report	Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling. Be aware of the limitations of evacuation modelling. Identify appropriate human performance data that can be used in evacuation analysis associated with fire. Critically assess the suitability of various evacuation modelling tools.
E051550 Risk Management	project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to analyse system behaviour and construct fault, event and decision trees
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture project	open book examination report oral examination	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Attitudes: Be aware of the own expertise and improve to expert level. Attitudes: Reflect on own way of thinking and acting. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Be aware of on-going evolutions in the field of interest. Skills: Analyse own results and results of others within fire performance based designs in an objective manner.
E051630 Fire Safety Strategy Project	project	participation	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051550 Risk Management	project	oral examination report	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051482 Active Fire Protection I: Detection and Suppression	lecture seminar project	open book examination report oral examination	Make a critical assessment of the different manual suppression systems and automatic suppression methods for different incident types, by means of calculations and technical considerations. Make a critical assessment, by means of calculations and technical considerations, of different fire detection methods. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E051443 Fire Safety and Legislation	lecture	open book examination	adopt an attitude aimed at the follow-up and application of the most recent legislation
E061522 Performance-Based Design	lecture self-reliant study activities	participation report assignment	Attitudes: Be aware of the own expertise and improve to expert level. Attitudes: Be aware of on-going evolutions in the field of interest.
E051461 Interaction between People and Fire	lecture	report	Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues.
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*			
E051482 Active Fire Protection I: Detection and Suppression	lecture seminar project	open book examination report oral examination	Make a critical assessment of the different manual suppression systems and automatic suppression methods for different incident types, by means of calculations and technical considerations. Make a critical assessment, by means of calculations and technical considerations, of different fire detection methods. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation.
E051494 Active Fire Protection II: Smoke and Heat Control	project	open book examination report oral examination	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration
E051610 Passive Fire Protection	lecture online lecture seminar: coached exercises	written examination	Classify a building product based on test results Analyse a construction detail for passive fire protection systems Give an overview of fire protection systems possible for different applications, including their respective advantages and disadvantages
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions report assignment participation	Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Reflect on own way of thinking and acting. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Discuss performance based design in the English language.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051570 Material Behaviour at Ambient and Elevated Temperatures	lecture lecture: plenary exercises	oral examination	Understand testing methods to determine properties of materials Know, compare and interpret in a critical manner the temperature dependent properties of different materials Recommend materials as function of the requested application
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Explain the nature of likely human behaviour associated with evacuation in fire situations. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner.
E051550 Risk Management	project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to analyse system behaviour and construct fault, event and decision trees
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
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*			
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Determine the uncertainties in the design. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Explain the nature of likely human behaviour associated with evacuation in fire situations. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner. Identify appropriate human performance data that can be used in evacuation analysis associated with fire.
E051550 Risk Management	project seminar	oral examination report	Being able to execute simple reliability analyses of level 2 and 3 Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
E051600 Structural Fire Engineering	lecture lecture: response lecture seminar: coached exercises	oral examination assignment participation	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture seminar: coached exercises project	written examination report oral examination open book examination	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration Apply national and international standards and regulative documents for the design of smoke control systems
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work project lecture	written examination with open questions report assignment participation	Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language.
E051630 Fire Safety Strategy Project	demonstration	oral examination	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051430 Fire Dynamics	lecture practicum	oral examination	Analyse fire dynamics in an enclosure.
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	oral examination job performance assessment assignment	Report in a structured and scientific manner, using appropriate language Present to audiences with different backgrounds
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Critically assess an evacuation analysis performed using evacuation modelling tools. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner. Critically assess the suitability of various evacuation modelling tools.
E051550 Risk Management	lecture seminar project	written examination report oral examination	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
E051600 Structural Fire Engineering	lecture lecture: response lecture seminar: coached exercises	oral examination assignment participation	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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*			
E051482 Active Fire Protection I: Detection and Suppression	project	report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	project	report	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Determine the uncertainties in the design. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	assignment job performance assessment	Report in a structured and scientific manner, using appropriate language Perform a comprehensive literature study on a specified fire related topic, including scientific referencing Schedule work on a dedicated project, plan ahead and report intermediate steps
E051461 Interaction between People and Fire	project	open book examination oral examination	Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner.
E051600 Structural Fire Engineering	seminar: coached exercises	participation assignment	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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
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E051482	Active Fire Protection I: Detection and Suppression	project	report	Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Design, together with colleagues, a fire detection installation for a building.
E051494	Active Fire Protection II: Smoke and Heat Control	project	oral examination	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E061522	Performance-Based Design	group work project lecture	participation report assignment	Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Skills: Control the results of a performance based design. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design.
E051630	Fire Safety Strategy Project	project	participation assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051461	Interaction between People and Fire	project	open book examination oral examination	Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner.
E051550	Risk Management	project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees

Course	Teaching methods	Evaluation methods	Course learning outcome
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E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	project	report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work project lecture	participation report assignment	Skills: Report performance based design orally, in writing and with graphical methods.
E051630 Fire Safety Strategy Project	demonstration project	oral examination peer assessment assignment participation	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	oral examination job performance assessment assignment	Report in a structured and scientific manner, using appropriate language Present to audiences with different backgrounds
E051461 Interaction between People and Fire	project	open book examination oral examination	Critically assess an evacuation analysis performed using evacuation modelling tools. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner.
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
E051600 Structural Fire Engineering	lecture lecture: response lecture seminar: coached exercises	oral examination assignment participation	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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*			
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration Apply national and international standards and regulative documents for the design of smoke control systems
E061522 Performance-Based Design	group work project lecture	participation report assignment	Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language.
E051630 Fire Safety Strategy Project	demonstration project	oral examination peer assessment assignment participation	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	assignment job performance assessment	Report in a structured and scientific manner, using appropriate language Schedule work on a dedicated project, plan ahead and report intermediate steps Present to audiences with different backgrounds
E051461 Interaction between People and Fire	lecture project	open book examination report oral examination	Explain the nature of likely human behaviour associated with evacuation in fire situations. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner. Be aware of the limitations of evacuation modelling. Identify appropriate human performance data that can be used in evacuation analysis associated with fire. Critically assess the suitability of various evacuation modelling tools. Critically assess an evacuation analysis performed using evacuation modelling tools. Critically assess the engineering literature associated with human behaviour in fire evacuation and evacuation modelling.
E051550 Risk Management	project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to analyse system behaviour and construct fault, event and decision trees
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	project	report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Reflect on own way of thinking and acting. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051550 Risk Management	lecture project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Apply national and international standards and regulative documents for the design of smoke control systems
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Control the results of a performance based design.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E061522 Performance-Based Design	lecture self-reliant study activities	participation	Attitudes: Be aware of on-going evolutions in the field of interest.
E051461 Interaction between People and Fire	lecture	report	Explain the nature of likely human behaviour associated with evacuation in fire situations.
E051550 Risk Management	lecture		Being able to recognize and describe risks
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Apply national and international standards and regulative documents for the design of smoke control systems
E051443 Fire Safety and Legislation	lecture	open book examination	critical insight into existing legislation and regulations adopt an attitude aimed at the follow-up and application of the most recent legislation
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk.
E051630 Fire Safety Strategy Project	demonstration project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051461 Interaction between People and Fire	lecture	report	Explain the nature of likely human behaviour associated with evacuation in fire situations.
E051550 Risk Management	lecture project	oral examination report	Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
E051600 Structural Fire Engineering	lecture lecture: response lecture seminar: coached exercises	oral examination assignment participation	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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*			
E051494 Active Fire Protection II: Smoke and Heat Control	lecture seminar: coached exercises project	written examination report oral examination open book examination	Perform a critical evaluation of a smoke and heat control system design Make a correct CFD calculation in the context of a smoke and heat control system design Calculate an original design of smoke and heat control systems for a realistic configuration
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Reflect on own way of thinking and acting. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design.
E051630 Fire Safety Strategy Project	demonstration	oral examination	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051550 Risk Management	lecture project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Determine the uncertainties in the design. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk.
E051550 Risk Management	lecture project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to analyse system behaviour and construct fault, event and decision trees
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Design, together with colleagues, a fire detection installation for a building.
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Skills: Control the results of a performance based design. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design.
E051550 Risk Management	lecture project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Design, together with colleagues, a fire detection installation for a building.
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models.
E051581 Fire Research Seminar	lecture lecture: plenary exercises project	assignment job performance assessment	Report in a structured and scientific manner, using appropriate language Perform a comprehensive literature study on a specified fire related topic, including scientific referencing Present to audiences with different backgrounds
E051461 Interaction between People and Fire	lecture	report	Identify appropriate human performance data that can be used in evacuation analysis associated with fire.
E051550 Risk Management	lecture project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria
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*			
E051540 Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Design, together with colleagues, a fire detection installation for a building.
E051494 Active Fire Protection II: Smoke and Heat Control	lecture seminar: coached exercises project	written examination report oral examination open book examination	Perform a critical evaluation of a smoke and heat control system design Compute and critically evaluate the removal of heat from an enclosure Make a correct CFD calculation in the context of a smoke and heat control system design Compute and critically evaluate the movement of smoke inside, into and out of an enclosure Calculate an original design of smoke and heat control systems for a realistic configuration
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions report assignment participation	Skills: Determine the uncertainties in the design. Attitudes: Reflect on own way of thinking and acting. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Be aware of the own expertise and improve to expert level.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051550 Risk Management	project		Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria
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*				
E051540	Explosions and Industrial Fire Safety	lecture seminar	open book examination	TOPICS: industrial fire and explosion protection. COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level. INSIGHTS: understand the physical processes that occur during explosions.
E051482	Active Fire Protection I: Detection and Suppression	project	report	Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Design, together with colleagues, a fire detection installation for a building.
E061522	Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models.

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051610 Passive Fire Protection	lecture online lecture	written examination	Give an overview of fire protection systems possible for different applications, including their respective advantages and disadvantages
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk.

Course		Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*				
E051482	Active Fire Protection I: Detection and Suppression	project	oral examination report	Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment. Design, together with colleagues, a fire detection installation for a building.
E061522	Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Skills: Determine the uncertainties in the design.
E051550	Risk Management	lecture seminar project	written examination report oral examination	Being able to execute simple reliability analyses of level 2 and 3 Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to apply decision theory in order to arrive at justifiable decisions in the framework of risk management Being able to analyse system behaviour and construct fault, event and decision trees Being able to execute qualitative and quantitative risk analyses on practical relevant situations

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

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Be aware of on-going evolutions in the field of interest.
E051630 Fire Safety Strategy Project	demonstration project	oral examination peer assessment assignment participation	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …

Course	Teaching methods	Evaluation methods	Course learning outcome
*Noot: leer- en evaluatievormen voorafgegaan door ** werden niet teruggevonden in de studiefiche*			
E051421 Fluid Mechanics Applications in Fire	lecture seminar: coached exercises	written examination report oral examination open book examination	Design an original pipe netwerk with fire sprinklers, fed by means of a pump sump Understand the interaction of air and water with smoke. Understand pressurized flow in pipes, pipe networks and manifolds Calculate flows through vertical and horizontal openings. Select a relevant pump and duty point for a pipe network Understand the flow phenomena involved in entrainment of air into a smoke plume and into a momentum driven jet Understand atomisation in fire sprinklers and describe the liquid spray Understand the background of the hydraulic aspects of an international (European) standard for design of fire sprinkler installations.
E051482 Active Fire Protection I: Detection and Suppression	project	oral examination report	Write a report and present it orally to colleagues, with respect to the design of an automatic fire protection installation. Design, together with colleagues, a fire detection installation for a building. Design, together with colleagues, a fire suppression installation that is not only based on water extinguishment.
E051494 Active Fire Protection II: Smoke and Heat Control	project	oral examination report	Calculate an original design of smoke and heat control systems for a realistic configuration Make a correct CFD calculation in the context of a smoke and heat control system design
E061522 Performance-Based Design	group work self-reliant study activities project lecture	participation report assignment	Attitudes: Be aware of the own expertise and improve to expert level. Attitudes: Be aware of on-going evolutions in the field of interest.
E051550 Risk Management	project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to analyse system behaviour and construct fault, event and decision trees
E051590 Compartmentation Strategies	excursion seminar: coached exercises ** fieldwork project lecture	participation report assignment	Draw up compartmentation strategies for uncommon buildings Check in a critical manner implemented compartmentation on-site Draw up and check compartmentation strategies in accordance with prescriptive guidance
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*			
E051700 CFD for Fire Safety Engineering	lecture project	oral examination report	Perform CFD simulations with a good quality Apply the Fire Dynamics Simulator (FDS) for a wide variety of fire scenarios Apply CFD and critically evaluate the reliability of the results based on the capabilities of state-of-the-art CFD for Fire Safety Engineering
E061522 Performance-Based Design	group work self-reliant study activities project lecture	written examination with open questions report assignment participation	Knowledge: Draw the appropriate safety conclusions from the risk analysis. Attitudes: Reflect on own way of thinking and acting. Skills: Select, motivate and apply the proper models, methods and techniques for risk based engineering models. Attitudes: Take up independent positions about fire safety designs and defend the point of view. Knowledge: Use functional criteria (performance) as a criterion in order to realise and evaluate an original fire safety design. Skills: Report performance based design orally, in writing and with graphical methods. Skills: Control the results of a performance based design. Knowledge: Evaluate self-reliantly the fire risk in a project. Attitudes: Act in an ethical, professional and social way when presenting and defining performance based design. Attitudes: Be aware of on-going evolutions in the field of interest. Skills: Analyse own results and results of others within fire performance based designs in an objective manner. Attitudes: Communicate and collaborate with colleagues. Skills: Discuss performance based design in the English language. Skills: Make and evaluate approximate estimates in a design. Skills: Apply the concept of risk management and the fire prevention techniques in order to produce a fire safe design with an acceptable risk. Attitudes: Collaborate in the multidisciplinary environment of Fire Safety Engineering. Attitudes: Be aware of the own expertise and improve to expert level. Knowledge: Master and apply the advanced knowledge of previous courses by integrating the fire protection techniques into a global risk performance based design. Skills: Determine the uncertainties in the design.
E051630 Fire Safety Strategy Project	project	assignment	Develop a complete fire safety strategy for a challenging project, including active fire protection systems, passive systems, evacuation strategy, use of materials, structural fire behaviour, …
E051461 Interaction between People and Fire	project	open book examination report oral examination	Critically assess an evacuation analysis performed using evacuation modelling tools. Undertake an evacuation simulation using appropriate evacuation modelling tools and interpret the results in a critical manner.
E051550 Risk Management	project	oral examination report	Being able to execute qualitative and quantitative risk analyses on practical relevant situations Being able to recognize and describe risks Being able to refect critically about the appropriateness and limitations of available statistical data, risk analyses and risk acceptance criteria Being able to analyse system behaviour and construct fault, event and decision trees
E051600 Structural Fire Engineering	lecture lecture: response lecture seminar: coached exercises	oral examination assignment participation	Determine design specifications (e.g., concrete cover, insulation thicknesses) for structural elements, in function of the fire resistance requirements Determine the deformation and capacity of structural elements in common building materials (timber, concrete, steel) during fire exposure Analyse the effect of restraint conditions on structural fire performance
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.