Implementation Regulations CER HZ

Bachelor

INDUSTRIAL ENGINEERING & MANAGEMENT

Full-time

CROHO 34421

2022-2023

UNIVERSITY OF APPLIED SCIENCES

INDEX

CHAPTER 1 GENERAL PROVISIONS

1.1 General

1.1.1 The HZ Course and Examination Regulations Bachelor programme full-time (hereinafter: HZ CER ba ft) cover the core of education within the HZ. This document provides a general overview of all programmes taught at the HZ. The HZ CER Ba ft contains institution-specific provisions, i.e. those that apply to the entire HZ. A programme-specific HZ CER Implementation Regulation (hereinafter: Implementation Regulation) is determined for each programme by the executive board each year.

1.1.2 The HZ Course and Examination Regulations Bachelor programme full-time applies to this HZ CER Implementation Regulation Bachelor programme full-time.

1.1.3 The Dutch Higher Education and Research Act (WHW) as well as the HZ CER ba ft mention study credits. These Implementation Regulations, in addition to the term credits, also refer to ECTS (European Credits Transfer System), where 1 ECTS is equal to 1 credit and thus a study load of 28 hours (article 7.4 paragraph 1 of WHW).

1.2 Establishment and evaluation

1.2.1 The process of establishment and evaluation of this Implementation Regulation is described in article 1.3.4 CER HZ ba ft.

1.2.2 The programme committee evaluates the manner of implementation of the education and examination regulations and the Implementation Regulations in question every year (article 1.3.4 CER HZ ba ft).

CHAPTER 2 IMPLEMENTATION REGULATIONS HZ CER

2.1 Registration, prior educational requirements, and admission policy

2.1.1 Overview of additional prior educational requirements (article 2.3 HZ CER Ba ft in addition to the requirements as listed under article 2.2 and 2.2a and 2.2b of HZ CER Ba ft)

Students with a havo diploma				
Havo profiles:	**NT**	**NG**	**EM**	**CM**
Admissible:	Sufficient	Sufficient	Sufficient	Sufficient*

Students with a vwo diploma				
Vwo profiles:	**NT**	**NG**	**EM**	**CM**
Admissible:	Sufficient	Sufficient	Sufficient	Sufficient*

* if completed with Mathematics A or B

2.1.1a ***Selection criteria Special programme*** (article 2.2b HZ CER ba ft)
Not applicable.

2.1.1b ***Enrolment 180 ECTS track for VWO students*** (article 2.2a CER HZ Ba ft)
Not applicable.

2.1.2 ***Deficiency investigation*** (article 2.4 CER HZ ba ft)

Students who do not meet the legal requirements to enrol the Industrial Engineering and Management programme (e.g. students with a Dutch HAVO or VWO diploma without Mathematics A or B) must demonstrate by the 1st of September of that school year that they have acquired the required level Mathematics. Summer courses in mathematics which can provide the students with the required certificates are offered by HZ.
https://hz.nl/opleidingen/type-schakelcursus

Students older than 21 years will have to pass an entrance exam.
https://hz.nl/en/opleidingen/alternative-entrance-exam,
https://blog.hz.nl/toelastingsonderzoek-naar-het-hbo-de-21-test

2.2.3 ***Additional requirements*** (article 2.5 CER ba ft)
Not applicable.

2.2 Programme and education structure

2.2.1 ***Programme profile*** (article 3.2 CER HZ Ba ft)

The study programme Industrial Engineering & Management trains engineers with a broad range of skills who will manage, improve and redesign business processes at companies. The Industrial Engineering & Management professional has a respect for people and their environment and is valuable for our society from a green, sustainable and circular economic perspective. Companies are confronted with constantly changing requirements. Production processes must be modified at an increased rate or new production processes must be designed. The life cycle of products is getting shorter due to the rapid changes in technology and the higher demands of the market. Furthermore, companies are forced to search for sustainable materials and processes because raw materials are becoming scarce.

To manage these changes, you need skilled technical professionals who are capable of integrating and organising these developments into the production processes of organisations. The IE&M professional has a respect for people and their environment and is valuable for our society from a green, sustainable and circular economic perspective. The IE & M deploys people and resources efficiently and effectively to realise the corporate objectives from the vision of the company.

The IE & M professional collaborates with almost all disciplines within an organisation to advise on matters or to come up with solutions for issues that the organisation is faced with as a result of a constantly changing environment. To this end, the IE & M professional methodically analyses processes, structures, systems and cultures and gives advice on how to make these more effective and/or efficient.

The starting point of every teaching block (=period of ten weeks) are the actual professional products that the student must deliver in his future profession. In order to deliver these products, the student must carry out assignments at a company. To this end, companies submit cases and projects. The structure of these projects is defined by the study programme. In the first academic year, companies deliver actual cases instead of the actual project. Students learn how to handle real-life cases. The actual assignment/project is formulated by the study programme. As a result, the study programme ensures that first-year students work on level 1, from a non-complex situation.

The study programme Industrial Engineering & Management takes the three pillars of student-oriented and process-oriented learning as the starting point. Furthermore, these three pillars are central to every block within the programme. The pillars are:

1. Use of authentic professional situations
2. Activate students to reinforce learning from each other
3. Develop students into professionals

The study programme uses authentic professional situations in order to translate the learning objectives into actual educational situations. Each block relates to a real professional case which is the central subject of the block. This real professional situation is therefore an intrinsic part of the integrative assignment that the student will carry out as a project. The IE & M students collaborate with other students to answer the integrative assignment. The knowledge and skills required to

succeed in the assignments are provided to the students during the lectures, study assignments and workplace assignments. The execution of workplace assignments takes place at host companies. The integrative assignment is the guiding and connecting element in the educational programme. Each block therefore consists of two differentiated parts: an integral course in which the project is the central element and a variety of conceptual courses to guarantee the required basic knowledge. The learning objectives for each block are clustered in the courses and might be assessed accordingly during the study programme. The courses contained in the blocks must therefore not be viewed as separated entities but as meaningful parts that contribute to the authentic professional cases.

2.2.2 ***Learning outcomes*** (article 3.2 CER HZ Ba ft)

Compe-tence	Sub task	LD Code	Learning objective
C1-Analysis	DT-1.a-Selection of relevant aspects in respect of the question/issue	LD-1.a.1	LD-1.a.1- Analyse the technological level, the level of maintenance, and the level of usage of an asset from a maintenance perspective
		LD-1.a.2	LD-1.a.2- Analyse the technological, organisational and cultural context of a maintenance situation.
		LD-1.a.3	LD-1.a.3- Analyse the value, efficiency, the risks and the available controlling mechanisms for a given process.
		LD-1.a.5	LD-1.a.5- List and describe the characteristics of a given asset.
		LD-1.a.6	LD-1.a.6- Present an analysis to (re-)design and/or change a given process
	DT-1.b-Indication of the possible influence on commercial, social and specialist subject-related aspects	LD-1.b.1	LD-1.b.1- Analyse the technological, organisational and cultural context of a new and complex maintenance situation, taking into account future developments
		LD-1.b.2	LD-1.b.2- Apply knowledge of market positioning and market developments
		LD-1.b.3	LD-1.b.3- Assess the importance of the creation of business strategies and their impact on technology
		LD-1.b.4	LD-1.b.4- Describe the value and risks for a given asset.
		LD-1.b.5	LD-1.b.5- Evaluate a choice for the long-term on relevant criteria.
		LD-1.b.6	LD-1.b.6- Justify make-or-buy decisions.
	DT-1.c-Formulating a clear problem outline, objective and assignment according to the wishes of the customer	LD-1.c.1	LD-1.c.1- Compare the existing structures, procedures and behaviour in a maintenance situation with the results of the analysis
	DT-1.d-Drawing up a schedule of (technical and non-technical) requirements and laying down those requirements	LD-1.d.1	LD-1.d.1- Demonstrate understanding of assets maintenance and optimisation during the asset lifecycle
		LD-1.d.2	LD-1.d.2- Evaluate tactical and strategic choices based on relevant criteria
		LD-1.d.3	LD-1.d.3- Explain interrelations and differences between long-term performance and short-term performance
		LD-1.d.4	LD-1.d.4- Prepare and validate multi-criteria-analysis
	DT-1.e-Modelling an existing product, process or service	LD-1.e.1	LD-1.e.1- Apply statistics and probabilities in the analysis of an existing product, process or service.
		LD-1.e.2	LD-1.e.2- Assess business processes and propose improvements including process redesign
		LD-1.e.3	LD-1.e.3- Describe business processes (including maintenance processes) and systems and their performance.
		LD-1.e.4	LD-1.e.4- Describe degradation mechanisms
		LD-1.e.5	LD-1.e.5- Make appropriate (Asset Management) information available for decision making

Compe-tence	Sub task	LD Code	Learning objective
C2-Design	DT-2.a-On the basis of the requirements imposed, the ability to elaborate and select a concept solution (architecture)	LD-2.a.1	LD-2.a.1- Find technological developments applicable to design
		LD-2.a.2	LD-2.a.2- Identify and consider guidelines and norms
		LD-2.a.3	LD-2.a.3- Translate strategic choices into required characteristics of technology, maintenance and usage
		LD-2.a.4	LD-2.a.4- Translate strategic choices into preferred characteristics for the processes designing, maintaining and using assets
	DT-2.b-Producing detailed designs according to the selected concept solution (architecture)	LD-2.b.1	LD-2.b.1- (re-)design of assets
		LD-2.b.2	LD-2.b.2- Apply methodical design
		LD-2.b.3	LD-2.b.3- Create an adequate plan to put the chosen (re)design into operation
		LD-2.b.4	LD-2.b.4- Describe the operational characteristics of processes and assets
	DT-2.c-The ability to take account of the makeability and testability of the design	LD-2.c.1	LD-2.c.1- Define testing procedures and instruments.
		LD-2.c.2	LD-2.c.2- Describe functional demands, performance and limitations of technological processes
		LD-2.c.3	LD-2.c.3- Explain strategy formation and translation into the design of processes and choices in technology
	DT-2.d-Verifying the design according to the schedule of requirements	LD-2.d.1	LD-2.d.1- Manage maintenance (re)design tasks in a methodical adequate way
		LD-2.d.2	LD-2.d.2- Use technogical developments
C3-Realisation	DT-3.a-Making suitable use of materials, processes, norms and standards	LD-3.a.3	LD-3.a.3- Describe methods and tools for usage of technical systems
		LD-3.a.4	LD-3.a.4- Describe safety and environment requirements including laws, guidelines and norms that need to be taken into consideration in a given situation
		LD-3.a.5	LD-3.a.5- Describe social, ethical and society-related aspects that need to be taken into consideration in a given situation
	DT-3.b-Assembling components into a complete product, service or process	LD-3.b.1	LD-3.b.1- Explain the relation between use of and maintenance on assets
	DT-3.c-Verifying and validating the product, service or process in respect of the requirements imposed	LD-3.c.1	LD-3.c.1- Apply knowledge of USE (usage, safety and environment) aspects in maintenance situations
		LD-3.c.2	LD-3.c.2- Create an adequate plan for implementation.
		LD-3.c.3	LD-3.c.3- Create proposals for improvement on technological, maintenance or usage level
	DT-3.d-Documenting the realisation process	LD-3.d.1	LD-3.d.1- Recall and explain existing asset and process documents and write them down when required
		LD-3.d.2	LD-3.d.2- Verify policies on product and process mix and the relation to usage and maintenance

Compe-tence	Sub task	LD Code	Learning objective
C4-Control	DT-4.b-Delivering a contribution to control systems and/or maintenance plans, both corrective (monitoring, identifying and optimising) and preventive (anticipating)	LD-4.b.1	LD-4.b.1- Arrange data and/or information and recognise the use of information systems
		LD-4.b.2	LD-4.b.2- Calculate asset reliability
		LD-4.b.3	LD-4.b.3- Enumerate and define maintenance concepts such as corrective, time-based, use-based and condition-based
		LD-4.b.4	LD-4.b.4- Explain QDC-control for maintenance processes
		LD-4.b.5	LD-4.b.5- List the criteria to be taken into account for configuration management
		LD-4.b.6	LD-4.b.6- Monitor and review asset improvement progress and asset performance
	DT-4.c-The ability to assess the performance of a product, service or process according to quality criteria	LD-4.c.1	LD-4.c.1- Describe how to define performance indicators in general and performance measurements for maintenance assets in particular
		LD-4.c.2	LD-4.c.2- Determine and explain technological system performances and structures
		LD-4.c.3	LD-4.c.3- Determine and explain the performance of a non-complex maintenance situation
		LD-4.c.4	LD-4.c.4- Develop and manage quality assurance processes
		LD-4.c.5	LD-4.c.5- Explain how to determine risks, reliability and availability for a given asset
		LD-4.c.6	LD-4.c.6- Explain the relation between use, maintenance and reliability for an asset in a maintenance situation
	DT-4.d-The ability to provide feedback in response to changing circumstances and/or performance of a product, service or process	LD-4.d.1	LD-4.d.1- Apply knowledge of the external context to a maintenance situation
		LD-4.d.2	LD-4.d.2- Apply PDCA-cycle
		LD-4.d.3	LD-4.d.3- Learn from incidents
		LD-4.d.4	LD-4.d.4- Prioritise between actions to be taken
		LD-4.d.5	LD-4.d.5- Recognise failure behaviour and its characteristics
		LD-4.d.6	LD-4.d.6- Translate characteristics of the design, technology, maintenance and usage processes of assets into options for strategic choices and limitations.

Compe-tence	Sub task	LD Code	Learning objective
C5-Management	DT-5.a-Organising a (sub)project: quantifying time and money, assessing and quantifying risks, drawing up project documentation and organising resources (human and material)	LD-5.a.1	LD-5.a.1- Apply management accounting principles
		LD-5.a.2	LD-5.a.2- Coach a multi-party group in the process of choosing between alternatives, evaluating tactical and strategic choices and using relevant multidimensional criteria
		LD-5.a.3	LD-5.a.3- Create relevant criteria for the choice between proposals for improvement and create a plan for the implementation of the choice made.
		LD-5.a.4	LD-5.a.4- Determine the strategic value of a complex asset, taking into account the long-term strengths, weaknesses, opportunities and threats of the business using the asset
		LD-5.a.5	LD-5.a.5- Describe and apply the RACI model to identify roles and responsibilities during an organizational change process
	DT-5.b-Monitoring and readjusting activities in terms of time, money, quality, information and organisation	LD-5.b.1	LD-5.b.1- (Re-)Design structures and procedures and propose changes in management style and organisational behaviour, in a complex maintenance situation
		LD-5.b.2	LD-5.b.2- Analyse the interrelations between business processes to create proposals for improvements (esp. the design process, the usage and the maintenance process) taking into consideration the possibility of conflicting interests of stakeholders
		LD-5.b.3	LD-5.b.3- Assess the importance of knowledge management
		LD-5.b.4	LD-5.b.4- Define learning behaviour and apply knowledge of change management
		LD-5.b.5	LD-5.b.5- Determine new alternative opportunities and translate these opportunities into a new process or product
		LD-5.b.6	LD-5.b.6- Evaluate performance, competence and training needs to meet operational strategies and objectives
	DT-5.b-Monitoring and readjusting activities in terms of time, money, quality, information and organisation	LD-5.b.7	LD-5.b.7- Explain elementary maintenance concepts, tasks, guidelines and norms as well as technological components and its characteristics to optimise usage and maintenance-related choices during the asset life cycle
		LD-5.b.8	LD-5.b.8- Explain in a non-complex maintenance situation the qualitative relations between performances, related to the design of the asset, the business processes (esp. the maintenance process) and the USE-aspects
		LD-5.b.9	LD-5.b.9- Identifying human resources needs to meet operational strategies and objectives
	DT-5.d-Supervising employees, encouraging cooperation and the ability to delegate	LD-5.d.1	LD-5.d.1- Describe aspects of human behaviour
	DT-5.e-Communication and cooperation with others in a multicultural, international and/or multidisciplinary environment, and fulfilling the requirements imposed by participation in a labour organisation	LD-5.e.1	LD-5.e.1- Assess an organisation and its development (Culture, change, …)
		LD-5.e.2	LD-5.e.2- Cooperate in multicultural, international and/or multidisciplinary project groups
		LD-5.e.3	LD-5.e.3- Create approval and support for the plan for implementation including data gathering among those directly involved
		LD-5.e.4	LD-5.e.4- Describe methods for assessment in HRM-systems

Compe-tence	Sub task	LD Code	Learning objective
C6-Advice	DT-6.a-Empathy with the position of the (internal or external) customer	LD-6.a.1	LD-6.a.1- Apply knowledge about stakeholders to understand their position
		LD-6.a.2	LD-6.a.2- Asses internal and external relations of business functions
		LD-6.a.3	LD-6.a.3- Distinguish and interpret human behaviour and performance to understand the position of the (internal or external) customer
	DT-6.c-In consultation with relevant parties, translating the customer requirements into technically & economically viable solutions	LD-6.c.1	LD-6.c.1- Apply and encourage multi-party cooperation
		LD-6.c.2	LD-6.c.2- Describe technological contexts and systems
		LD-6.c.3	LD-6.c.3- Explain asset value and risk
		LD-6.c.4	LD-6.c.4- Explain operational behaviour and performances from choices in the design of processes and structures, and from actual operational management
		LD-6.c.5	LD-6.c.5- Suggest improvements in the maintenance process and the maintenance planning and control in a given context.
	DT-6.d-The ability to underpin advice with arguments, and duly convince the client	LD-6.d.1	LD-6.d.1- Coach a process of choosing between alternative opportunities for the long term, involving all relevant stakeholders
C7-Research (HZ)	DT-7.a-Research preparation. You are able to make a proposal for (applied) research and set up a research project to solve problems in practical situations.	LD-7.a.1	LD-7.a.1- Formulate a problem statement (which comprises the problem description, research question and objective).
		LD-7.a.2	LD-7.a.2- Conduct a literature review.
		LD-7.a.3	LD-7.a.3- Set up a research project and define it in a research proposal.
	DT-7.b-You are able to conduct research (or have it conducted), as described in the research proposal, monitor progress and quality and make adjustments where necessary.	LD-7.b.1	LD-7.b.1- Collect the required data and process it accordingly to enable a meaningful interpretation.
	DT-7.b-You are able to conduct research (or have it conducted), as described in the research proposal, monitor progress and quality and make adjustments where necessary.	LD-7.b.2	LD-7.b.2-Monitor progress and implementation and make adjustments where necessary.
	DT-7.c-Completing research: You are able to interpret data and draw conclusions regarding the research question. Additionally, you are able to	LD-7.c.1	LD-7.c.1- Ascribe significance to retrieved and processed data.
		LD-7.c.2	LD-7.c.2- Report research results.
	DT-7.d-Researcher's attitude: You act in accordance with the (ethical) code of conduct associated with research.	LD-7.d.1	LD-7.d.1- Adapt your behaviour to the norms, professional ethics, attitude and responsibilities associated with research.

Compe-tence	Sub task	LD Code	Learning objective
C8-Professionalisation	DT-8.b-Adopting a flexible approach in a range of professional situations	LD-8.b.1	LD-8.b.1- Design and manage organisational change
	DT-8.c-When faced with professional and ethical dilemmas, making sound considerations and making a decision, taking account of accepted standards and values	LD-8.c.1	LD-8.c.1- Determine the evaluation criteria for a given task and reflect on one's own and other members' qualification elements using the evaluation criteria
		LD-8.c.2	LD-8.c.2- Interrelations between social developments, ethical considerations, strategic choices and norms for performance
		LD-8.c.3	LD-8.c.3- Reflect on the choices made and the results from a social and ethical point of view taking into account the presence or absence of a social basis for approval and support
	DT-8.e-The ability to reflect on own actions, thoughts and outcomes	LD-8.e.1	LD-8.e.1- Reflect on one's own and other group members' role, behaviour, contribution and results obtained in a group process
	DT-8.f-The ability to use a range of communication forms and tools in order to be able to effectively communicate in Dutch and English.	LD-8.f.1	LD-8.f.1- Defend own explanation and assess someone else's explanation.
	DT-8.f-Be able to use a range of forms of and tools for communication in order to be able to effectively communicate.	LD-8.f.2	LD-8.f.2- Report adequately both orally and in writing on the proposed improvements to the direct involved and other stakeholders

Additionally, the following attitudes are specifically related to the competences:

In **analysing (DT1),** the engineer displays the following attitudes: a. deciding what aspects are relevant for the question; b. indicating what economic, societal and technical aspects may be affected; c. formulating a clear-cut problem definition, objective and assignment, based on the client's demands; d. drafting and documenting a programme of requirements; e. modelling an existing product, process of service

In **designing (DT2)**, the engineer displays the following attitudes: a. choosing a concept solution (architecture), based on the requirements; b. drawing detailed designs from the concept solution (architecture); c. taking into account the design's feasibility and testability; d. checking the design against the programme of requirements; e. selecting the right design tools; f. drawing up documentation for the product, service or process.

In **realising (DT3),** the engineer displays the following attitudes: a. the right use of materials, processes, methods, norms and standards; b. assembling components into an integral product, service or process; c. verifying and validating a product, service or process against the requirements; d. documenting the realisation process.

In **controlling (DT4)**, the engineer displays the following attitudes: a. implementing, testing, integrating and commissioning a new product, service or process; b. contributing to management systems and/or maintenance plans, by monitoring, flagging and optimising (corrective measures) and anticipating (preventive measures); c. checking the performance of a product, service or process against quality standards; d. referring back changes in circumstances and/or performance of a product, service or process.

In **managing (DT5)**, the engineer displays the following attitudes: a. starting up a project: quantifying the required time and budget, assessing and weighing risks, setting up the project documentation and organising resources; b. monitoring and managing activities with regard to budget, time, quality, information and organisation; c. task and process oriented communication; d. supervising employees, stimulating collaboration and delegating tasks; e. communicating and collaborating with others in a multicultural, international and/or multidisciplinary environment.

In **advising (DT6),** the engineer displays the following attitudes: a. understanding the needs of internal and external customers; b. clarifying what de client requires; c. translating the customer needs into technically and financially viable solutions; d. substantiating an advice to convince the customer; e. maintaining good relationships with customer

In **researching (DT7)**, the engineer displays the following attitudes: a. translating hypotheses into research objectives; b. independently selecting, validating and obtaining (scientific) literature and other information sources in order to understand the hypothesis fully; c. summarising, arranging and interpreting results and drawing conclusions regarding the research question; d. reporting results according to the relevant professional standard; e. using the obtained results to critically evaluate the approach chosen and provide recommendations for future research

In **professionalising (DT8)**, the engineer displays the following attitudes: a. choosing a learning outcome and strategy independently, and using the result to reflect on the learning outcome; b. being flexible in all kinds of professional situations; c. taking shared norms and values into account when weighing a decision in professional and ethical dilemmas; d. being constructive in giving and receiving feedback; e. being able to reflect on his behaviour, thinking and results; f. being able to use various forms and means to communicate in English.

2.2.3 ***Programme structure*** (article 3.3, 3.11a en 3.13 CER HZ ba ft)

National name:	Bachelor Technische Bedrijfskunde
International name:	Bachelor Industrial Engineering & Management
Orientation:	Bachelor
Title conferred:	Bachelor of Science (BSc)
Programme duration:	240 study credits (ECTS)
Course workload 'propaedeutic' phase:	60 study credits (ECTS)
Conclusion with 'propaedeutic' examination:	Yes
Course workload main phase:	180 study credits (ECTS)
Variant:	Full-time
ISAT code:	34421
Location:	Middelburg
Language:	English
Effective date:	05-07-2011
Submission date	01-11-2024
Joint degree programme:	Not applicable
180 ECTS fast track:	No

The schedules of the curriculum are included hereafter.

2.2.3a Transfer with an Associate Degree certificate (article 3.3 paragraph 4 sub l CER HZ ba ft)
Not applicable.

Course program (cohort 2022-2026)

Year 4	CU72028V1 (27,5 ECTS) Focus on the Future: analysing strategic innovations		CU72030V1 (30 ECTS) Graduation Project		Might be subject to change
	CU72029V1 (2.5 ECTS) Free Composition Course 6				
Year 3	Minor (30 ECTS)		CU72026V2 (27,5 ECTS) Internship		
			CU72025V1 (2.5 ECTS) Free Composition Course 5		
Year 2	CU72018V1 (10 ECTS) Project: Process design		CU72021V1 (10 ECTS) Project: Process re-design		
	CU20558 (2.5 ECTS) Special Material Conditions	CU20563 (2.5 ECTS) Material Design and Engineering	CU72022V1 (2.5 ECTS) Mechanical Manufacturing Systems	CU20571 (2.5 ECTS) Process Manufacturing Systems	
	CU20561 (2.5 ECTS) Business information systems	CU20569 (2.5 ECTS) Information and Technology Innovation	CU72027V1 (2.5 ECTS) Organisational Behaviour	CU72023V1 (2.5 ECTS) Corporate Social Responsibility	
	CU20559 (1,25 ECTS) Marketing Fundamentals	CU20570 (2.5 ECTS) Innovation Management	CU20568 (2.5 ECTS) Marketing Plan	CU72032V1 (2.5 ECTS) Supply Chain Management	
	CU72019V1 (2.5 ECTS) Sustainability	VCCU20574 (1.25 ECTS) Free Composition Course 3	VCCU20575 (1.25 ECTS) Free Composition Course 4	CU72024V1 (1,25 ECTS) Change Management	
	CU72020V3 (2.5 ECTS) - English for Industrial Engineering & Management 3		CU22566V2 (2.5 ECTS) - English for Industrial Engineering & Management 4		
Year 1	CU72010V2 (5 ECTS) Project: Production and Business processes. Health and Safety.	CU20577 (5 ECTS) Project: Asset and Maintenance Management	CU72014V1 (5 ECTS) Project: Quality Management	CU72016V2 (5 ECTS) Project: Operational Excellence	
	CU20549 (2.5 ECTS) Finance and Investment Analyses	CU20578 (2.5 ECTS) Project Management	CU20553 (2.5 ECTS) Mechanical Material Properties	CU20555 (2.5 ECTS) Material Loading and Failure	
	CU72012V2 (2.5 ECTS) Operations Management	CU20573V1 (2.5 ECTS) Asset Management	CU20554 (2.5 ECTS) Management Accounting	CU72017V1 (2.5 ECTS) Operational Excellence	
	CU20550 (1.25 ECTS) Research Skills	VCCU20545 (1.25 ECTS) Free Composition Course 1	CU72015V1 (2.5 ECTS) Communication Skills	CU20579 (2.5 ECTS) Statistics	
	CU72031V1 (5 ECTS) Applied Physics		CU20547V1 (1.25 ECTS) Statistics Fundamentals	VCCU20546 (1.25 ECTS) Free Composition Course 2	
	CU22491V2 (2.5 ECTS) - English for Industrial Engineering & Management 1		CU22492V3 (2.5 ECTS) - English for Industrial Engineering & Management 2		

HZ Personality
Projects
Concepts

Course program (cohort 2021-2025)

Year 4	CU72028V1 (27,5 ECTS) Focus on the Future: analysing strategic innovations		CU72030V1 (30 ECTS) Graduation Project		Might be subject to change
	CU72029V1 (2.5 ECTS) Free Composition Course 6				
Year 3	Minor (30 ECTS)		CU72026V2 (27,5 ECTS) Internship		
			CU72025V1 (2.5 ECTS) Free Composition Course 5		
Year 2	CU72018V1 (10 ECTS) Project: Process design		CU72021V1 (10 ECTS) Project: Process re-design		
	CU20558 (2.5 ECTS) Special Material Conditions	CU20563 (2.5 ECTS) Material Design and Engineering	CU72022V1 (2.5 ECTS) Mechanical Manufacturing Systems	CU20571 (2.5 ECTS) Process Manufacturing Systems	
	CU20561 (2.5 ECTS) Business information systems	CU20569 (2.5 ECTS) Information and Technology Innovation	CU72027V1 (2.5 ECTS) Organisational Behaviour	CU72023V1 (2.5 ECTS) Corporate Social Responsibility	
	CU20559 (1,25 ECTS) Marketing Fundamentals	CU20570 (2.5 ECTS) Innovation Management	CU20568 (2.5 ECTS) Marketing Plan	CU72032V1 (2.5 ECTS) Supply Chain Management	
	CU72019V1 (2.5 ECTS) Sustainability	VCCU20574 (1.25 ECTS) Free Composition Course 3	VCCU20575 (1.25 ECTS) Free Composition Course 4	CU72024V1 (1,25 ECTS) Change Management	
	CU72020V3 (2.5 ECTS) - English for Industrial Engineering & Management 3		CU22566V2 (2.5 ECTS) - English for Industrial Engineering & Management 4		
Year 1	CU72010V1 (5 ECTS) Project: Production and Business processes. Health and Safety.	CU20577 (5 ECTS) Project: Asset and Maintenance Management	CU72014V1 (5 ECTS) Project: Quality Management	CU72016V1 (5 ECTS) Project: Operational Excellence	
	CU72011V1 (2.5 ECTS) Mathematics	CU20578 (2.5 ECTS) Project Management	CU20553 (2.5 ECTS) Mechanical Material Properties	CU20555 (2.5 ECTS) Material Loading and Failure	
	CU20549 (2.5 ECTS) Finance and Investment Analyses	CU72013V1 (2.5 ECTS) Physics	CU20554 (2.5 ECTS) Management Accounting	CU72017V1 (2.5 ECTS) Operational Excellence	
	CU72012V2 (2.5 ECTS) Operations Management	CU20573V1 (2.5 ECTS) Asset Management	CU72015V1 (2.5 ECTS) Communication Skills	CU20579 (2.5 ECTS) Statistics	
	CU20547 (1.25 ECTS) Statistics Fund. and Research Skills	VCCU20545 (1.25 ECTS) Free Composition Course 1	CU20550 (1.25 ECTS) Research Skills	VCCU20546 (1.25 ECTS) Free Composition Course 2	
	CU22491V1 (2.5 ECTS) - English for Industrial Engineering & Management 1		CU22492V2 (2.5 ECTS) - English for Industrial Engineering & Management 2		

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Course program (cohort 2020-2024)

Year 4	CU72028V1 (27,5 ECTS) Focus on the Future: analysing strategic innovations		CU72030V1 (30 ECTS) Graduation Project		Might be subject to change
	CU72029V1 (2.5 ECTS) Free Composition Course 6				
Year 3	Minor (30 ECTS)		CU72026V2 (27,5 ECTS) Internship		
			CU72025V1 (2.5 ECTS) Free Composition Course 5		
Year 2	CU72018V1 (10 ECTS) Project: Process design		CU72021V1 (10 ECTS) Project: Process re-design		
	CU20558 (2.5 ECTS) Special Material Conditions	CU20563 (2.5 ECTS) Material Design and Engineering	CU72022V1 (2.5 ECTS) Mechanical Manufacturing Systems	CU20571 (2.5 ECTS) Process Manufacturing Systems	
	CU20561 (2.5 ECTS) Business information systems	CU20569 (2.5 ECTS) Information and Technology Innovation	CU72027V1 (2.5 ECTS) Organisational Behaviour	CU72023V1 (2.5 ECTS) Corporate Social Responsibility	
	CU20559 (1,25 ECTS) Marketing Fundamentals	CU20570 (2.5 ECTS) Innovation Management	CU20568 (2.5 ECTS) Marketing Plan	CU70223V2 (2.5 ECTS) Supply Chain Management	
	CU72019V1 (2.5 ECTS) Sustainability	VCCU20574 (1.25 ECTS) Free Composition Course 3	VCCU20575 (1.25 ECTS) Free Composition Course 4	CU72024V1 (1,25 ECTS) Change Management	
	CU72020V2 (2.5 ECTS) - English for Industrial Engineering & Management 3		CU22566V1 (2.5 ECTS) - English for Industrial Engineering & Management 4		
Year 1	CU72010V1 (5 ECTS) Project: Production and Business processes. Health and Safety.	CU20577 (5 ECTS) Project: Asset and Maintenance Management	CU72014V1 (5 ECTS) Project: Quality Management	CU72016V1 (5 ECTS) Project: Operational Excellence	
	CU72011V1 (2.5 ECTS) Mathematics	CU20578 (2.5 ECTS) Project Management	CU20553 (2.5 ECTS) Mechanical Material Properties	CU20555 (2.5 ECTS) Material Loading and Failure	
	CU20549 (2.5 ECTS) Finance and Investment Analyses	CU72013V1 (2.5 ECTS) Physics	CU20554 (2.5 ECTS) Management Accounting	CU72017V1 (2.5 ECTS) Operational Excellence	
	CU72012V2 (2.5 ECTS) Operations Management	CU20573 (2.5 ECTS) Asset Management	CU72015V1 (2.5 ECTS) Communication Skills	CU20579 (2.5 ECTS) Statistics	
	CU20547 (1.25 ECTS) Statistics Fund. and Research Skills	VCCU20545 (1.25 ECTS) Free Composition Course 1	CU20550 (1.25 ECTS) Research Skills	VCCU20546 (1.25 ECTS) Free Composition Course 2	
	CU22491V1 (2.5 ECTS) - English for Industrial Engineering & Management 1		CU22492V2 (2.5 ECTS) - English for Industrial Engineering & Management 2		

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Course programme (cohort 2019-2023)

Year 4	**CU72028V1 (27,5 ECTS)** **Focus on the Future: analysing strategic innovations**		**CU72030V1 (30 ECTS)** **Graduation Project**	
	CU72029V1 (2.5 ECTS) Free Composition Course 6			
Year 3	**Minor (30 ECTS)**		**CU72026V1 (27,5 ECTS)** **Internship**	
			CU72025V1 (2.5 ECTS) Free Composition Course 5	
Year 2	**CU72018V1 (10 ECTS)** **Project: Process design**		**CU72021V1 (10 ECTS)** **Project: Process re-design**	
	CU20558 (2.5 ECTS) **Special Material Conditions**	**CU20563 (2.5 ECTS)** **Material Design and Engineering**	**CU72022V1 (2.5 ECTS)** **Mechanical Manufacturing Systems**	**CU20571 (2.5 ECTS)** **Process Manufacturing Systems**
	CU72027V1 (2.5 ECTS) **Organisational Behaviour**	**CU20561 (2.5 ECTS)** **Business information systems**	**CU20569 (2.5 ECTS)** **Information and Technology Innovation**	**CU72023V1 (2.5 ECTS)** **Corporate Social Responsibility**
	CU20559 (1,25 ECTS) **Marketing Fundamentals**	**CU20570 (2.5 ECTS)** **Innovation Management**	**CU20568 (2.5 ECTS)** **Marketing Plan**	**CU70223V2 (2.5 ECTS)** **Supply Chain Management**
	CU72019V1 (2.5 ECTS) **Sustainability**	**VCCU20574 (1.25 ECTS)** **Free Composition Course 3**	**VCCU20575 (1.25 ECTS)** **Free Composition Course 4**	**CU72024V1 (1,25 ECTS)** **Change Management**
	CU72020V2 (2.5 ECTS) - English for Industrial Engineering & Management 3		**CU22566V1 (2.5 ECTS) - English for Industrial Engineering & Management 4**	
Year 1	**CU72010V1 (5 ECTS)** **Project: Production and Business processes. Health and Safety.**	**CU20577 (5 ECTS)** **Project: Asset and Maintenance Management**	**CU72014V1 (5 ECTS)** **Project: Quality Management**	**CU72016V1 (5 ECTS)** **Project: Operational Excellence**
	CU72011V1 (2.5 ECTS) **Mathematics**	**CU20578 (2.5 ECTS)** **Project Management**	**CU20553 (2.5 ECTS)** **Mechanical Material Properties**	**CU20555 (2.5 ECTS)** **Material Loading and Failure**
	CU20549 (2.5 ECTS) **Finance and Investment Analyses**	**CU72013V1 (2.5 ECTS)** **Physics**	**CU20554 (2.5 ECTS)** **Management Accounting**	**CU72017V1 (2.5 ECTS)** **Operational Excellence**
	CU72012V1 (2.5 ECTS) **Operations Management**	**CU20573 (2.5 ECTS)** **Asset Management**	**CU72015V1 (2.5 ECTS)** **Communication Skills**	**CU20579 (2.5 ECTS)** **Statistics**
	CU20547 (1.25 ECTS) **Statistics Fund. and Research Skills**	**VCCU20545 (1.25 ECTS)** **Free Composition Course 1**	**CU20550 (1.25 ECTS)** **Research Skills**	**VCCU20546 (1.25 ECTS)** **Free Composition Course 2**
	CU22491V1 (2.5 ECTS) - English for Industrial Engineering & Management 1		**CU22492V2 (2.5 ECTS) - English for Industrial Engineering & Management 2**	

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Course programme (cohort 2018-2022)

Year 4	CU72028V1 (27,5 ECTS) Focus on the Future: analysing strategic innovations		CU72030V1 (30 ECTS) Graduation Project	
	CU72029V1 (2.5 ECTS) Free Composition Course 6			
Year 3	Minor (30 ECTS)		CU72026V1 (27,5 ECTS) Internship	
			CU72025V1 (2.5 ECTS) Free Composition Course 5	
Year 2	CU72018V1 (10 ECTS) Project: Process design		CU72021V1 (10 ECTS) Project: Process re-design	
	CU20558 (2.5 ECTS) Material Sciences III	CU20563 (2.5 ECTS) Material Design and Engineering	CU72022V1 (2.5 ECTS) Mechanical Manufacturing Systems	CU20571 (2.5 ECTS) Process Manufacturing Systems
	CU72027V1 (2.5 ECTS) Organisational Behaviour	CU20561 (2.5 ECTS) Business information systems	CU20569 (2.5 ECTS) Information and Technology Innovation	CU72023V1 (2.5 ECTS) Corporate Social Responsibility
	CU20559 (1,25 ECTS) Marketing Fundamentals	CU20570 (2.5 ECTS) Innovation Management	CU20568 (2.5 ECTS) Marketing	CU70223V1 (2.5 ECTS) Supply Chain Management
	CU72019V1 (2.5 ECTS) Sustainability	VCCU20574 (1.25 ECTS) Free Composition Course 3	VCCU20575 (1.25 ECTS) Free Composition Course 4	CU72024V1 (1,25 ECTS) Change Management
	CU72020V1 (2.5 ECTS) - English for Industrial Engineering & Management 3		CU22566 (2.5 ECTS) - English for Industrial Engineering & Management 4	
Year 1	CU20576 (8.75 ECTS) Project: Introduction to Production and Business processes	CU20577 (5 ECTS) Project: Asset and Maintenance Management	CU20541V2 (7.5 ECTS) Project: Quality Management	CU20580 (8.75 ECTS) Project: Operational Excellence
	CU20549 (2.5 ECTS) Finance I	CU20578 (2.5 ECTS) Project Management	CU20553 (2.5 ECTS) Material Sciences I	CU20555 (2.5 ECTS) Material science II
	CU20547 (1.25 ECTS) Statistics I and Research Skills	CU20550 (1.25 ECTS) Research Skills		
	CU20548V1 (1.25 ECTS) Mathematics	CU20551 (1.25 ECTS) Physics	CU20554 (2.5 ECTS) Finance II	CU20579 (2.5 ECTS) Statistics II and research skills
		CU20573 (2.5 ECTS) Asset Management		
	CU22491V1 (2.5 ECTS) - English for Industrial Engineering & Management 1		CU22492V2 (2.5 ECTS) - English for Industrial Engineering & Management 2	
	VCCU20545 (1.25 ECTS) Free Composition Course 1		VCCU20546 (1.25 ECTS) Free Composition Course 2	

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Course programme (cohort 2017-2021)

Year 4	**CU72028V1 (27,5 ECTS)** **Focus on the Future: analysing strategic innovations**		**CU72030V1 (30 ECTS)** **Graduation Project**	
	CU72029V1 (2.5 ECTS) Free Composition Course 6			
Year 3	**Minor (30 ECTS)**		**CU72026V1 (27,5 ECTS)** **Internship**	
			CU72025V1 (2.5 ECTS) Free Composition Course 5	
Year 2	**CU20556 (11.25 ECTS)** **Project: Process re-design**		**CU20565 (11.25 ECTS)** **Project: Process design**	
	CU20558 (2.5 ECTS) **Material Sciences III**	**CU20563 (2.5 ECTS)** **Material Sciences IV**	**CU20567 (2.5 ECTS)** **Material Sciences in Manufacturing Processes I**	**CU20571 (2.5 ECTS)** **Material Sciences in Manufacturing Processes II**
	CU20561 (2.5 ECTS) **Business information systems I**	**CU20569 (2.5 ECTS)** **Business information systems II**	**CU20570 (2.5 ECTS)** **Innovation and Change Management**	**CU70292V1 (5 ECTS)** **Supply Chain Management**
	CU20559 (1,25 ECTS) **Marketing Fundamentals**			
	CU20572 (1.25 ECTS) Sustainability and Corporate Social Responsibility	**CU20562 (2.5 ECTS)** **Organization Theory**	**CU20568 (2.5 ECTS)** **Marketing**	
	CU22557 (2.5 ECTS) - English for Industrial Engineering & Management 3		**CU22566 (2.5 ECTS) - English for Industrial Engineering & Management 4**	
	VCCU20574 (1.25 ECTS) Free Composition Course 3		**VCCU20575 (1.25 ECTS) Free Composition Course 4**	
Year 1	**CU20537V1 (5 ECTS)** **Project: Introduction to Production processes**	**CU20539V1 (7,5 ECTS)** **Project: Maintenance Management**	**CU20541V1 (7.5 ECTS)** **Project: Quality Management**	**CU20543V1 (7.5 ECTS)** **Project: Continuous Improvement**
	CU20538V1 (10 ECTS) **Introduction to Industrial Engineering and Management**	**CU20540V1 (5 ECTS)** **Asset Management**	**CU20542V1 (7.5 ECTS)** **Systems Assurance**	**CU20544V1 (2.5 ECTS)** **Operational Excellence**
		CU22491V1 (2.5 ECTS) - English for Industrial Engineering & Management 1		**CU22492V1 (2.5 ECTS) - English for Industrial Engineering & Management 2**
		CU20545V1 (1.25 ECTS) **Free Composition Course 1**		**CU20546V1 (1.25 ECTS)** **Free Composition Course 2**

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2.2.4 Courses 'propedeuse' phase (article 3.5, 3.11A CER HZ Ba ft)

Block 1 / Semester 1												
CU20549	**Title:** Finance and investment analyses					**Number of study credits: 2.5**		**Number of contact hours: 15**		**Mandatory**	**Teaching language: English**	
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: The student will be introduced to the disciplines of finance and accounting. The course focuses on understanding fundamental financial calculations and ratios that are the basis of the courses following later in the programme.												
Compulsory literature: Basics of financial management / exercises / answers and solution, Brouwers, R., Koetzier, W.												
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		W		X		Written knowledge test	LD-5.a.1	100%	5.5	45	48	3	6

Block 1 / Semester 1											
CU20550	**Title:** Research Skills					**Number of study credits: 1.25**		**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: None											
Conditions for test participation: None											
Brief description of course content: Students will be challenged to develop a critical mind-set while gaining knowledge about research methods and strategies. Students will learn the basics of scoping their research, writing a research objective and defining research questions. During this course the students will discuss research ethics and will work on assignments to develop their knowledge in research terminology and the research process as well as their abilities to write a problem statement, research objective and research questions. This course covers both quantitative and qualitative research methods.											
Compulsory literature: Research. This is it!, B. Baarda, 3rd ed											
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Assignment	LD-7.a.1, LD-7.a.2, LD-7.c.1, LD-7.c.2	100%	5.5	45	47	3	5

Block 1 / Semester 1					
CU72010V2	**Title:** Project: Introduction to Production and Business processes. Health and Safety	**Number of study credits: 5**	**Number of contact hours: 60**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					

Brief description of course content:

The student will be part of a project team which will work on assignments in order to observe and describe the different aspects of a production/service process within a given company and the business processes at a department or at the entire company. This course is mainly practical and is based on the experiences gained by students at their host companies. Teamwork and professionalism are essential competencies that the student will have to acquire and demonstrate during the course of the project.

This course uses the 7S model as a basis to describe the business processes. Furthermore it will cover aspects of operations management such as process mapping, process lay-outs, techniques and simple time studies. Students will learn health and safety aspects related to the risks of performing tasks at or around assets. Additionally, this module provides knowledge of and insight in workplace hazards and risk controls including ergonomics, work equipment, electrical safety, fire safety, physical stress, psychological stress, chemical and physical health hazards.

Compulsory literature: - Management, an evidence based approach, Keuning, D., Bossink, B. & Tjemkes, B., 3rd ed. - VCA online module and other literature provided by the teaching team. The HZ sponsors the cost of the VCA official exam for a maximum of 2 attempts. In case the student needs more attempts, the cost of these will have to be covered by the student

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x			x	Assignment: Health and Safety	LD-3.a.4	25%	5.5	45	47	3	5
TOETS02		x		x		Written knowledge test (VCA certificate)	LD-3.a.4	0%	Ok	48	Not applicable	12	Not applicable
TOETS03		x			x	Assignment: Production Processes	LD-1.e.1, LD-2.b.4, LD-3.a.4, LD-4.d.2, LD-6.c.2, LD-7.d.1,	25%	5.5	45	47	3	5
TOETS04		x			x	Assignment: Business Processes	LD-2.b.4, -, LD-6.c.2, LD-7.d.1	25%	5.5	45	47	3	5
TOETS05		x		x		Assignment: Reflection	LD-5.e.2, LD-8.e.1	25%	5.5	45	47	3	5

Block 1 / Semester 1					
CU72012v2	**Title:** Operations Management	**Number of study credits: 2.5**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Students will gain insight in the analysis of manufacturing processes and the business processes in service organisations and will learn how to classify these processes. Furthermore, they will learn to understand the tactical and operational consequences of this classification and how to measure the operations performance. Finally, students will learn how to structure and control transformational processes based on performance objectives.					
Compulsory literature: Operations Management, Brandon-Jones, A., Slack, N. & Johnston, R., 9th ed.					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	1.a.5, 1.d.2, 1.e.1, 1.e.3, 2.a.2, 2.b.4, 4.c.2, 6.c.2	100%	5.5	45	48	3	6

Block 1 and 2 / Semester 1					
CU72031V1	**Title:** Applied Physics	**Number of study credits: 5**	**Number of contact hours: 45**	**Mandatory**	**Teaching language: English**

Conditions for course participation: None

Conditions for test participation: None

Brief description of course content:

Student will get familiar with looking at working systems and trying to understand the physics behind it as well as selecting the relevant mathematical theory to support it. This will help them to analyse problems or improvement opportunities for these systems in an operational environment.
Students will explore the basic principles of physics like motion and force (Newton's laws), momentum, energy, rotational motion, machines and efficiency, solids, liquids and gases, heat and thermodynamics and electricity.
Fundamental principles of mathematics will be introduced to support the problems introduced for example, General mathematical expressions and calculations, working with SI Units and scientific notation , functions and graphs, trigonometry, vectors, differentiation and integration.

Compulsory literature: None

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Written knowledge test	LD-3.a.3, LD-2.b.2	50%	4.5	45	47	3	5
TOETS02		x		x		Written knowledge test	LD-3.a.3, LD-2.b.2	50%	4.5	4	6	14	16

Blocks 1 and 2 / Semester 1					
CU22491V2	**Title:** English for Industrial Engineering & Management 1	**Number of study credits: 2.5**	**Number of contact hours: 21**	**Mandatory**	**Teaching language: English**

Conditions for course participation: A2+/B1 level in General English

Conditions for test participation: Complete all course assignments and quizzes

Brief description of course content:

Course summary: Level B1/B1+

This course focuses on:

1. Reading and understanding technical business texts and documents.
2. Producing oral and written summaries.
3. Conducting technical business conversations on topics which relate to the professional field.
4. Describing technical processes (systems, products, …)
5. Obtaining the relevant technical business vocabulary.
6. Remedial grammar.

Goals:

- To read, understand and summarize business texts.
- To acquire and expand business vocabulary; to review grammar
- To conduct business conversations.
- To understand job advertisements.
- To describe technical processes.

*CEFR references:
https://learn.hz.nl/pluginfile.php/289968/mod_resource/content/0/CEFR-all-scales-and-all-skills.pdf

Compulsory literature: None

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Schedule** *If yes, mention duration*	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**									
TOETS01	X				X	**Oral Assessment**	No	CEFR references* at B1/B2 level: OSP, ORC, RFO, VR, GA, COH	25%	5.5	45	45	3	3
TOETS02		X		X		**Written Knowledge Test**	90 minutes	CEFR references at B1/B2 level: VR, VC, ORC, RFIA, GA, OC	45%	5.5	4	4	14	15
TOETS03	X				X	**Oral Assessment**	No	CEFR references* at B1/B2 level: OSI, C, IE, CS-AFC, SF	30%	5.5	4	4	14	14

Block 2 / Semester 1												
CU20573V1	**Title:** Asset Management					**Number of study credits: 2.5**		**Number of contact hours: 15**		**Mandatory**		**Teaching language: English**
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: The student will learn concepts related to Asset Management and Maintenance Management that can be applied in a work situation. The student will gain knowledge and insights on several disciplines such as asset selection an criticality, Total Productive Maintenance (TPM), Reliability Centered Maintenance (RCM) and Life Cycle Cost												
Compulsory literature: Provided by the teaching team												
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Written knowledge test	LD-1.b.4, LD-1.e.4 LD-2.a.1, LD-4.b.2 LD-4.b.3	100%	5.5	4	6	14	16

Block 2 / Semester 1												
CU20577	**Title:** Project Asset and Maintenance Management					**Number of study credits: 5**	**Number of contact hours: 21**		**Mandatory**		**Teaching language: English**	
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: The student will be introduced to maintenance management and will get insight in all relevant maintenance activities, taking into consideration the value of the assets. Students will work in project teams to gather and analyse information within an assigned company.												
Compulsory literature: None												
Test code	**Format** *Verbal/Written/Other* *Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x			x	Assignment (report)	LD-1.a.1, LD-1.a.2, LD-1.a.5, LD-1.e.3 LD-2.c.1, LD-2.d.1 LD-4.b.1, LD-4.d.5 LD-5.b.2, LD-6.c.2 LD-8.e.1	100%	5.5	4	6	14	16

Block 2 / Semester 1											
CU20578	**Title:** Project Management					**Number of study credits: 2.5**		**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: None											
Conditions for test participation: None											
Brief description of course content: During this course the students will gain knowledge about several project management methods and dimensions. The student will learn the basics of staying in control as project manager and will learn to write a project management plan. Students will gain insight on, for example, scoping a project, building a simple financial business case, several breakdown structures for projects, project risks and opportunities, stakeholders and project organisation.											
Compulsory literature: None											
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Assignment (report)	LD-1.a.3, LD-2.b.2, LD-2.b.3, LD-4.b.1, LD-4.c.1, LD-5.a.1, LD-5.a.5, LD-8.b.1	100%	5.5	4	7	14	17

Block 2 / Semester 1					
VCCU20545	**Title:** Free Composition Course 1	**Number of study credits: 1.25**	**Number of contact hours: 5**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: The educational programme of a study programme contains a free composition space of minimally 2.5 academic credits in each academic year. The student is allowed to earn FCC credits with extracurricular activities such as: management activities, informational and promotional activities, cultural activities, instructional activities, project activities or training activities. The student will submit proposals for the free composition space to the SCC or FCC assessor prior to the activity. Afterwards, the SCC or FCC assessor will assess if the activity was performed in a satisfactory manner. Further details regarding the content and related criteria can be found in last version of the Student Manual HZ Personality, HZ University of Applied Sciences.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Portfolio	LD-8.e.1	100%	Ok	4	6	25	27

Block 3 / Semester 2					
CU20547V1	**Title:** : Statistics Fundamentals	**Number of study credits: 1.25**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Students will develop their information skills regarding searching and using sources and information, including the use of APA. Furthermore the structure of a report will be discussed alongside with some tips and tricks regarding the use of Word for report writing. At the same time students will learn the basics of statistics, regarding descriptive statistics and probability calculations. During this part of the course students will gain a basic statistical vocabulary and basic skills to describe data and calculate probabilities.					
Compulsory literature: Statistics in 20 steps, Buijs, A., 2nd ed.					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Written knowledge test	LD-1.e.1, LD-7.a.2	100%	5.5	15	17	25	27

Block 3 / Semester 2					
CU20553	**Title:** Mechanical Material Properties	**Number of study credits: 2.5**	**Number of contact hours: 25**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Student will get familiar with the basic principles of material science and will gain a first understanding of the behaviour of materials under different conditions and learn how to assess their suitability in products and industrial processes. Key topics covered are: introduction to materials and manufacturing processes, matching material to design, innovation, stiffness and weight, elastic (stiffness-limited) design, plasticity, yielding and ductility.					
Compulsory literature: Materials engineering, science, processing and design, Ashby, M., Shercliff, H. & Cebon, D., 3rd ed.					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-2.a.1 LD-2.b.2	100%	5.5	15	18	25	28

Block 3 / Semester 2												
CU20554	**Title:** Management Accounting					**Number of study credits: 2.5**		**Number of contact hours: 15**		**Mandatory**		**Teaching language: English**
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: This part of the course focuses on management accounting, the costs structure of a company and cost calculations. Also financial reporting will be covered. How a company supplies the stake holders with financial information.												
Compulsory literature: Basics of financial management / exercises / answers and solution, Brouwers, R., Koetzier, W.												

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-5.a.1	100%	5.5	15	18	25	27

Block 3 / Semester 2					
CU72014V1	**Title:** Project Quality Management	**Number of study credits: 5**	**Number of contact hours: 30**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: This project consists of both quality management and classes to improve communication skills. For Quality management, the student will be introduced to several aspects of quality, both in products as in processes. Moreover, the students will get familiar with quality norms and standards as well as best practices. They will gain knowledge on quality management principles and approaches, such as quality planning, quality control, quality assurance and quality improvement.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Portfolio	LD-1.a.6, LD-1.e.2, LD-3.c.2, LD-4.b.1, LD-4.d.2, LD-4.d.4, LD-8.c.3, LD-8.c.1	75%	5.5	15	18	25	27
TOETS02	X				X	Presentation	LD-3.c.2, LD-8.f.2	25%	5.5	15	18	25	27

Block 3 / Semester 2												
CU72015V1	**Title:** Communication Skills					**Number of study credits: 2.5**		**Number of contact hours:15**		**Mandatory**		**Teaching language: English**
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: Students will get to practise a wide variety of communication skills. Additionally, they will gain insights on organisation communication, online presence, listening and interviewing skills, conflict communication, negotiation skills and presentation skills. During the classes students will get theoretical backgrounds, hands-on tips and tricks and a set of tools they can use to improve their personal communication skills. The students will actively practise their skills during classes and work on assignments after every class to build their portfolio.												
Compulsory literature: Cross-cultural communication, Jacobs, A., 1st ed.												
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Portfolio	LD-8.f.2	100%	5.5	15	17	25	27

Blocks 3 and 4 / Semester 2					
CU22492V3	**Title:** English for Industrial Engineering & Management 2	**Number of study credits: 2.5**	**Number of contact hours: 21**	**Mandatory**	**Teaching language: English**

Conditions for course participation: Pass for CU22491 or equivalent competences (teacher's discretion)

Conditions for test participation: Complete all course assignments and quizzes

Brief description of course content:

Course summary: Level B1+/B2
This course focuses on:

1. Reading and understanding technical business texts and documents.
2. Describing trends
3. Understanding and describing trends (graphs and charts)
4. Writing a company profile
5. Giving a basic presentation/pitch linked to company profile.
6. Building and expanding relevant technical business vocabulary (portfolio).
7. Remedial grammar.

Goals:

- To understand and use language of trends
- To understand graphic information
- To transfer textual information into graphic information and vice versa
- To describe graphs and charts, both in writing and orally
- To review relevant grammar
- To read and understand technical texts.
- To write fluently at sentence & paragraph level.
- To expand technical vocabulary.

*CEFR references:
https://learn.hz.nl/pluginfile.php/289968/mod_resource/content/0/CEFR-all-scales-and-all-skills.pdf

Compulsory literature: None

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Schedule** *If yes, mention duration*	**Content** *Link with learning outcomes*	**Weighting Factor**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**									
TOETS01		X	X			**Criterion-referenced Assessment**	No	CEFR references at B1/B2 level: OWP, WR&E	30%	5.5	44	45	25	25
TOETS02	X				X	**Oral Assessment**	No	CEFR references at B1/B2 level: OSP-AA, SF, COH, TtF, VR, GA	40%	5.5	24	25	27	27
TOETS03		X		X		**Written Knowledge Test**	90 minutes	CEFR references* at B1/B2 level: VR, VC, GA, ORC, CR, COH, OC	30%	5.5	24	25	27	27

Block 4 / Semester 2													
CU20555	**Title:** : Material Loading and Failure					**Number of study credits: 2.5**		**Number of contact hours: 23**		**Mandatory**		**Teaching language: English**	
Conditions for course participation: None													
Conditions for test participation: None													
Brief description of course content: The student will gain a further understanding about the aspects of dynamic loading and the principles of material fracture and failure. Also a working knowledge of heat properties of materials will be covered with some basic design calculations.													
Compulsory literature: Materials, Engineering, Science, Processing and Design, Ashby, M., 3rd ed.													
Test code	**Format** *Verbal/Written/Other* *Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Written knowledge test	LD-2.b.4	100%	5.5	24	26	27	29

Block 4 / Semester 2												
CU20579	**Title:** Statistics					**Number of study credits: 2.5**		**Number of contact hours: 15**	**Mandatory**		**Teaching language: English**	
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: During this course the student will practise intermediate skills regarding samples and sampling, intervals and hypothesis testing. This course consists of studying online study materials in combination of practise practice and explanation during classes.												
Compulsory literature: Statistics in 20 steps, Buijs, A., 2nd ed.												
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-1.e.1	100%	5.5	24	26	27	28

Block 4 / Semester 2					
CU72016V2	**Title:** Project Operational Excellence	**Number of study credits: 5**	**Number of contact hours: 30**	**Mandatory**	**Teaching language: English**

Conditions for course participation: None

Conditions for test participation: None

Brief description of course content:

Analyse a production process and propose an optimization for this process at a company. A stakeholders' analysis and long-term view on the effects of the optimization is included in this plan. Students will work in project teams to gather and analyse information within an assigned company, using several analysis methods. Students will follow classes to obtain knowledge and follow-up on their progress. At the same time the students can book guidance regarding the research and statistics they'll need to use during this project.

The student will become familiar with a range of concepts used in optimization of (production) processes as well as with related terminology and will learn how to use these concepts to improve existing processes. Concepts include (but are not limited to) Lean/Six Sigma, TOC and QRM.

The student will have to do an on-line course for the DMAIC Yellow Belt. The student will have to pass the on-line exam.

Compulsory literature: On-line Yellow Belt course, Skoledo

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Assignment (report)	LD-1.a.6, LD-1.b.5, LD-1.d.4, LD-1.e.1, LD-1.e.2, LD-3.c.2, LD-4.c.4, LD-4.d.3, LD-5.a.3, LD-5.b.2, LD-6.c.1, LD-7.b.1	80%	5.5	24	26	27	28
TOETS02	X				X	Presentation	LD-1.e.1, LD-8.e.1	20%	4.0	24	26	27	28
TOETS03			X	X		Written knowledge test (DMAIC Yellow Belt)	LD1a-3, LD1a-6, LD1d-4, LD1e-1	0%	5.5	24	26	27	28

Block 4 / Semester 2											
CU72017V1	**Title:** Operational Excellence					**Number of study credits: 2.5**		**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: None											
Conditions for test participation: None											
Brief description of course content: The student will become familiar with a range of concepts used in optimization of (production) processes as well as with related terminology and will learn how to use these concepts to improve existing processes. Concepts include (but are not limited to) Lean/Six Sigma, TOC and QRM.											
Compulsory literature: Operational Excellence, Marcel van Assen, 1st ed.											

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-1.a.6 LD-1.d.4 LD-1.e.1	100%	5.5	24	26	27	28

Block 4 / Semester 2					
VCCU20546	**Title:** Free Composition Course 2	**Number of study credits: 1.25**	**Number of contact hours: 2**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: The educational programme of a study programme contains a free composition space of minimally 2.5 academic credits in each academic year. The student is allowed to earn FCC credits with extracurricular activities such as: management activities, informational and promotional activities, cultural activities, instructional activities, project activities or training activities. The student will submit proposals for the free composition space to the SCC or FCC assessor prior to the activity. Afterwards, the SCC or FCC assessor will assess if the activity was performed in a satisfactory manner. Further details regarding the content and related criteria can be found in last version of the Student Manual HZ Personality, HZ University of Applied Sciences.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Portfolio	LD-8.e.1	100%	Ok	25	26	27	28

2.2.4 ***Main phase courses*** (article 3.6, 3.11A CER HZ ba ft)

Block 5 / Semester 3											
CU20558	**Title:** Special Material Conditions					**Number of study credits: 2.5**		**Number of contact hours: 25**	**Mandatory**		**Teaching language: English**
Conditions for course participation: None											
Conditions for test participation: None											
Brief description of course content: The student will get an introduction of the various characteristics and structure property relationships, as well as processing techniques of materials, to make judicious materials choices in design based on these criteria. Students will apply principles of materials behaviour at very high temperature, to select manufacturing processing steps for different applications, describe the characteristics of materials exposed to electric and magnetic loads and calculate key dimensions and describe technological options available to control different type of corrosion of materials.											
Compulsory literature: Materials engineering, science, processing and design, Ashby, M., Shercliff, H., Cebon, D. (2014). (3 ed.). Oxford, United Kingdom: Elsevier Ltd.											
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-2.a.1 LD-2.b.2 LD-2.b.4	100%	5.5	45	48	3	6

Block 5 / Semester 3												
CU20559	**Title:** Marketing fundamentals					**Number of study credits: 1.25**		**Number of contact hours: 18**		**Mandatory**	**Teaching language: English**	
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: Student will get an introduction to the principles of marketing, regarding market environment, customer value, segmentation, targeting, positioning, differentiation and marketing strategy and –planning.												
Compulsory literature: None												
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Written knowledge test	LD-1.b.2	100%	5.5	45	48	3	6

Block 5 / Semester 3												
CU20561	**Title:** Business information systems					**Number of study credits: 2.5**		**Number of contact hours: 15**	**Mandatory**		**Teaching language: English**	
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: During this course students will work on their understanding of Information Technology. Students will not only get familiar with terminology, business IT alignment and IT governance, they will also learn some basics in mark-up language.												
Compulsory literature: None												
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-7.a.1, LD-7.a.2, LD-7.c.1, LD-7.c.2	100%	5.5	45	47	3	5

Block 5 / Semester 3											
CU72019V1	**Title:** Sustainability					**Number of study credits: 2.5**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**		
Conditions for course participation: None											
Conditions for test participation: None											
Brief description of course content: During this course, students will get acquainted with norms, regulations and ethics regarding sustainability. Furthermore the students will work on understanding the effects of trends and developments regarding sustainability on organisations.											
Compulsory literature: None											
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Assignment (Essay)	LD-1.a.3, LD-3.a.4, LD-3.a.5, LD-7.a.2, LD-8.c.2	100%	5.5	45	47	3	5

Block 5 and 6 / Semester 3					
CU072018V1	**Title:** Project Process Design	**Number of study credits: 10**	**Number of contact hours: 42**	**Mandatory**	**Teaching language: English**

Conditions for course participation: None

Conditions for test participation: None

Brief description of course content:

Students will work in a project team on (several solutions for) a process design at a company for one semester. During this semester they will obtain a project assignment at the company. After having identified process objectives and having turned these into process demands, they will design a process in which all of the business needs are fulfilled. They will write a proposal which includes the project scope, a programme of requirements and a research approach. Students collaborate in working out the design or a separate solution for the selected process. Students will incorporate knowledge and skills from courses followed so far and during this project as well as knowledge and skills gained from their own research and study activities. Students will also consult with experts where necessary. Students may work together with students from other study programs to increase the (added) value of their design. During this project it is important for the student to work together in a project team and with several stakeholders within the company.

Compulsory literature: None

Test code	**Format** *Verbal/Written/Other* *Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		*x*			*x*	Assignment (report)	LD-2.d.2, LD-7.a.1, LD-7.d.1, LD-7.a.3	40%	5.5	45	47	3	5
TOETS02		*x*			*x*	Assignment (report)	LD-1.a.6, LD-1.b.3, LD-5.a.1, LD-5.a.5, LD-5.e.3, LD-5.e.4, LD-7.b.2, LD-7.c.1, LD-8.b.1	50%	5.5	4	6	14	16
TOETS03			*x*		*x*	Presentation	LD-1.a.6, 7c2	10%	5.5	2	4	6	8

Block 5 and 6 / Semester 3					
CU72020V3	**Title:** English for Industrial Engineering & Management 3	**Number of study credits: 2.5**	**Number of contact hours: 21**	**Mandatory**	**Teaching language: English**

Conditions for course participation: Pass for CU22492 or equivalent competences (teacher's discretion)

Conditions for test participation: Complete all course assignments and quizzes

Brief description of course content:

Course summary: Level B2/B2+

1. Essay writing
2. Technical Report writing
3. Reading and understanding (long) technical business texts and documents.
4. Building and expanding relevant technical business vocabulary (portfolio).
5. Describing properties, instructions and warnings
6. Stipulating conditions
7. Remedial grammar

Goals:

- To write accurately at paragraph and sentence level
- To understand how to write a technical report
- To read & understand long technical texts
- To expand technical vocabulary
- To review grammar

*CEFR references: https://learn.hz.nl/pluginfile.php/289968/mod_resource/content/0/CEFR-all-scales-and-all-skills.pdf

Compulsory literature: None

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Schedule** *If yes, mention duration*	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**									
TOETS01		X	X			**Criterion-referenced Assessment**	NO	CEFR references at B2 level: OWP, WR&E	50%	5.5	45	46	3	4
TOETS02		X		X		**Written Knowledge Test**	90 minutes	CEFR references at B2 level: OWP, WR&E	50%	5.5	45	46	3	4

Block 6 / Semester 3					
CU20563	**Title:** Material Design and Engineering	**Number of study credits: 2.5**	**Number of contact hours: 25**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Students will learn about the key design and engineering steps from the Engineering Design Methodology. They will be asked to identify the main application and process parameters relevant for a given case study and asset requirements. From these specifications the students will have to identify different conceptual solutions and select the best design concept for the case study application. They will further develop the best concept solution into more detailed design specification and obtain an appreciation of the manufacturing steps involved.					
Compulsory literature: Ashby, M., Shercliff, H., Cebon, D. (2014). Materials engineering, science, processing and design (3 ed.). Oxford, United Kingdom: Elsevier Ltd.					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01	X			x		Oral Assessment	LD-2.a.1 LD-2.b.2 LD-2.b.4	100%	5.5	4	4	14	14

Block 6 / Semester 3											
CU020569	**Title:** Information and Technology Innovation					**Number of study credits: 2.5**		**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: None											
Conditions for test participation: None											
Brief description of course content: Students will gain insights on developments and trends in technology for business. Students will look into topics such as IT innovation, use of software tools, AI for business intelligence, and block chain technology. Students will get insight in real company cases showing business opportunities provided by new developments. Students will learn how to implement technology innovation in an organization.											
Compulsory literature: Strategic Management of Technological Innovation, Melissa A. Schilling. Sixth edition. ISBN 978-1-260-565579-9											
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X			X	Assignment (paper)	LD-2.a.1, LD-2.a.2, LD-4.b.1, LD-4.c.2, LD-6.c.2, LD-2.d.2	100%	5.5	4	5	14	15

Block 6 / Semester 3					
CU020570	**Title:** Innovation Management	**Number of study credits: 2.5**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Students will learn what innovation is, they will practise creative and innovation skills and they will gain insights on how to manage innovation from idea generation to market-entry within an organization. Students will work with several innovation models and will get familiar with innovation approaches as seen in organizations.					
Compulsory literature: Strategic Management of Technological Innovation, Melissa A. Schilling. Sixth edition. ISBN 978-1-260-565579-9					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X			X	Assignment (paper)	LD-1.b.3, LD-3.a.5, LD-5.d.1, LD-5.e.3	100%	5.5	4	5	14	15

Block 6 / Semester 3					
VCCU20574	**Title:** Free Composition Course 3	**Number of study credits: 1.25**	**Number of contact hours: 2**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: The educational programme of a study programme contains a free composition space of minimally 2.5 academic credits in each academic year. The student is allowed to earn FCC credits with extracurricular activities such as: management activities, informational and promotional activities, cultural activities, instructional activities, project activities or training activities. The student will submit proposals for the free composition space to the SCC or FCC assessor prior to the activity. Afterwards, the SCC or FCC assessor will assess if the activity was performed in a satisfactory manner. Further details regarding the content and related criteria can be found in last version of the Student Manual HZ Personality, HZ University of Applied Sciences.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Portfolio	LD-8.e.1	100%	Ok	4	6	25	27

Block 7 / Semester 4												
CU20568	**Title:** Marketing plan					**Number of study credits: 2.5**		**Number of contact hours: 24**		**Mandatory**		**Teaching language: English**
Conditions for course participation: None												
Conditions for test participation: None												
Brief description of course content: . Students will write a marketing plan applying marketing fundamentals like a situational analysis of the actual market environment of a company involving concepts like customer value, segmentation, targeting, positioning, differentiation and marketing strategy and –planning.												
Compulsory literature: How to write a Marketing Plan - John Westwood – ISBN 9780749484835												
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Assignment	LD-1.b.2, LD-2.d.2, LD-5.b.5	100%	5.5	15	18	25	27

Block 7 / Semester 4					
CU72022V1	**Title:** Mechanical Manufacturing Systems	**Number of study credits: 2.5**	**Number of contact hours: 30**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: Mandatory participation in preparation and hosting of at least one lecture					
Brief description of course content: The student will gain knowledge and insight on mechanical manufacturing technologies for metals and plastics and their industrial application, as well as basic knowledge about manufacturing automation.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-2.d.2, LD-3.a.3, LD-4.c.2, LD-6.c.2	75%	5.5	15	17	26	28
TOETS02	X				X	Presentation	LD-2.d.2, LD-3.a.3, LD-4.c.2, LD-6.c.2	25%	5.5	15	17	26	28

Block 7 / Semester 4					
CU72027V1	**Title:** Organisational Behaviour	**Number of study credits: 2.5**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Students will deepen their knowledge on structures and behaviour and their relationship within organizations with the aim of understanding the social environmental and economic forces that affect our own careers nowadays. Students will gain knowledge about types of organisations and management styles as well as common theories and models that have been developed through decades to help analyse and address some managerial questions related to how to put strategy in practice, why some organisations are successful and others are not or how to deal with new technologies, pay, performance and talent.					
Compulsory literature: Essentials of Organisational Behaviour (Global edition), Stephen P. Robbins, Timothy Judge, 15th edition, ISBN 978-1-292-40666-4					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Portfolio	LD-1.e.2, LD-5.b.1	100%	5.5	15	17	25	27

Block 7 / Semester 4					
VCCU20575	**Title: Free Composition Course 4**	**Number of study credits: 1.25**	**Number of contact hours: 2**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: The educational programme of a study programme contains a free composition space of minimally 2.5 academic credits in each academic year. The student is allowed to earn FCC credits with extracurricular activities such as: management activities, informational and promotional activities, cultural activities, instructional activities, project activities or training activities. The student will submit proposals for the free composition space to the SCC or FCC assessor prior to the activity. Afterwards, the SCC or FCC assessor will assess if the activity was performed in a satisfactory manner. Further details regarding the content and related criteria can be found in last version of the Student Manual HZ Personality, HZ University of Applied Sciences.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Portfolio	LD-8.e.1	100%	Ok	25	26	27	28

Blocks 7 and 8 / Semester 4					
CU072021V1	**Title***:* Project Process re-design	**Number of study credits: 10**	**Number of contact hours: 21**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Students will work in a project team on (several solutions for) a process re-design at a company for one semester. During this semester they will obtain a project assignment at the company. They will write a proposal which includes the project scope and a division of tasks and subjects the student will cover. Each student works out one aspect of the redesign or a separate solution for the same process. Students will incorporate knowledge and skills from courses followed so far and during this project as well as knowledge and skills gained from their own research and study activities. Students will also consult with experts where necessary. During this project it is important for the student to work together in a project team and with several stakeholders within the company.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other* *Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting** **Factor (%)**	**Minimum** **score**	**Planning** **test in** **week**	**Inspection** **of work in week**	**Resit scheduled in week**	**Inspection** **of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x			x	Assignment (report)	LD-1.a.6, LD-1.c.1, LD-1.e.2, LD-6.c.5, LD-7.a.1, LD-7.a.2, LD-7.a.3, LD-7.d..1	40%	5.5	15	17	25	27
TOETS02		x			x	Assignment (report)	LD-1.a.3, LD-2.b.1, LD-2.b.3, LD-3.c.1, LD-6.c.3, LD-7.b.1, LD-7.b.2, LD-7.c.1,	50%	5.5	24	26	27	29
TOETS03			x		x	Presentation	LD-7.c.2, LD-8.f.1	10%	5.5	23	25	26	28

Blocks 7 and 8 / Semester 4					
CU22566V2	**Title:** English for Industrial Engineering & Management 4	**Number of study credits: 2.5**	**Number of contact hours: 21**	**Mandatory**	**Teaching language: English**

Conditions for course participation: Pass for CU72020 or equivalent competences at B1+ level (teacher's discretion)

Conditions for test participation: Complete all course assignments and quizzes

Brief description of course content:

Course summary: Level B2+

1. Conducting and participating in formal meetings. – collaborative problem-solving
2. Reading and understanding (long) technical business texts and documents.
3. Building and expanding relevant technical business vocabulary (portfolio).
4. Remedial grammar

Goals:

- To conduct and participate in formal business meetings
- To show ability to solve problems collaboratively
- To read and understand long technical texts
- To expand technical vocabulary
- To review grammar

*CEFR references: https://learn.hz.nl/pluginfile.php/289968/mod_resource/content/0/CEFR-all-scales-and-all-skills.pdf

Compulsory literature: None

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Schedule** *If yes, mention duration*	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**									
TOETS01	X				X	**Oral Assessment**	No	CEFR references at B2 level: OSI, FD	60%	5.5	24	24	27	27
TOETS02		X		X		**Written Knowledge Test**	90 minutes	CEFR references at B2 level: OWP, VR, VA	40%	5.5	24	25	27	27

Block 8 / Semester 4					
CU20571	**Title:** Process Manufacturing Systems	**Number of study credits: 2.5**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: The student will learn to describe and explain the general design aspects of common physical production processes used in the industry and one specific industry application in detail. They will obtain the ability to read and explain key components in P&IDs, process models and control system configurations and to explain the different functions and limitations of these components such as sensors and actuators. The student will be able to explain the implications of process dynamics, process safety and energy conservation requirements in the overall design and operations of industry processes.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written knowledge test	LD-2.d.2, LD-3.a.3, LD-4.c.2, LD-6.c.2	100%	5.5	24	26	27	28

Block 8 / Semester 4					
CU72032V1	**Title:** Supply Chain Management	**Number of study credits: 2.5**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Supply chain management (SCM) is "the management of the chain that connects independent customers and suppliers as if they were single entities with the aim of creating value and reducing waste through the coordination of goals and activities of all organizations in the chain." More than in the "ordinary" logistics field, organizations are nowadays looking for cooperation with other organizations within the own chain or beyond the boundaries of organizations in order to add value and reducing waste. Therefore, in this course he student will learn how interconnected members in a supply chain are related from the perspective of materials, information or financial means, in response to customers' demands.					
Compulsory literature: Logistics and supply chain management, Christopher M., 5th ed.					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Written knowledge test	LD-1.d.2;LD-3.a.3	100%	5.5	24	26	27	29

Block 8 / Semester 4											
CU72023V1	**Title:** Corporate Social Responsibility					**Number of study credits: 2.5**		**Number of contact hours: 15**	**Mandatory**		**Teaching language: English**
Conditions for course participation: None											
Conditions for test participation: None											
Brief description of course content: During this course, students will get acquainted with norms, regulations and ethics regarding corporate social responsibility. Furthermore the students will work on understanding the effects of trends and developments regarding corporate social responsibility on organisations.											
Compulsory literature: Ethics and business - A global introduction, Wernaart, B., 1st ed.											

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Written Knowledge test	LD-5.e.1	75%	5.5	24	26	27	29
TOETS02			X	X		Presentation (recorded)	LD-1.b.3, LD-1.b.6 LD-3.a.5, LD-5.b.6	25%	5.5	24	26	27	29

Block 8 / Semester 4					
CU72024V1	**Title:** Change Management	**Number of study credits: 1.25**	**Number of contact hours: 15**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: Students will deepen their knowledge on structures and behaviour and their relationship within organizations with the aim of understanding the social environmental and economic forces that affect our own careers nowadays. Students will gain knowledge about types of organisations and management styles as well as common theories and models that have been developed through decades to help analyse and address some managerial questions related to how to put strategy in practice, why some organisations are successful and others are not or how to deal with new technologies, pay, performance and talent.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Assignment (report)	LD-5.a.5, LD-5.b.4, LD-8.b.1, LD-5.d.1, LD-5.e.3	100%	5.5	24	26	27	29

Semester 5 or semester 6					
CU72025V1	**Title:** Free Composition Course 5	**Number of study credits: 2.5**	**Number of contact hours: 0**	**Mandatory**	**Teaching language: English**
Conditions for course participation: None					
Conditions for test participation: None					
Brief description of course content: The educational programme of a study programme contains a free composition space of minimally 2.5 academic credits in each academic year. The student is allowed to earn FCC credits with extracurricular activities such as: management activities, informational and promotional activities, cultural activities, instructional activities, project activities or training activities. The student will submit proposals for the free composition space to the SCC or FCC assessor prior to the activity. Afterwards, the SCC or FCC assessor will assess if the activity was performed in a satisfactory manner. Further details regarding the content and related criteria can be found in last version of the Student Manual HZ Personality, HZ University of Applied Sciences.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Portfolio	LD-8.e.1	100%	Ok	25	26	27	28

Block 9 and 10 / Semester 5 or Block 11 and 12 / Semester 6					
CU72026V2	**Title:** Internship "Exploring today: Managing operational challenges"	**Number of study credits: 27.5**	**Number of contact hours: 10 per student**	**Mandatory**	**Teaching language: English**
Conditions for course participation: Propaedeutic phase and 45 ECTS of the year 2 courses					
Conditions for test participation: None					
Brief description of course content: (see also article 2.2.8) The objective of the internship is to start building working-experience in your professional field at a company, organisation or research group. To achieve this objective, you will apply programme specific professional competences at an organisation by conducting a moderately complex design-oriented research, resulting in a (re)designed process. The internship also enables you to find out what interests you (most) and what future positions you desire.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		X		X		Assignment (Business Proposal)	DT 2, 3, 4 and 5, see description[1]	50%	5.5	4, 24	6, 26	14, 27	16, 28
TOETS02		X		X		Portfolio	DT 2, 3, 4 and 5, see description	50%	5.5	4, 24	6, 26	14, 27	16, 28

[1] < 10 working days after publication of mark

[1] In **designing (DT2)**, the engineer displays the following attitudes: a. choosing a concept solution (architecture), based on the requirements; b. drawing detailed designs from the concept solution (architecture); c. taking into account the design's feasibility and testability; d. checking the design against the programme of requirements; e. selecting the right design tools; f. drawing up documentation for the product, service or process.

In **realising (DT3),** the engineer displays the following attitudes: a. the right use of materials, processes, methods, norms and standards; b. assembling components into an integral product, service or process; c. verifying and validating a product, service or process against the requirements; d. documenting the realisation process.

In **controlling (DT4)**, the engineer displays the following attitudes: a. implementing, testing, integrating and commissioning a new product, service or process; b. contributing to management systems and/or maintenance plans, by monitoring, flagging and optimising (corrective measures) and anticipating (preventive measures); c. checking the performance of a product, service or process against quality standards; d. referring back changes in circumstances and/or performance of a product, service or process.

In **managing (DT5)**, the engineer displays the following attitudes: a. starting up a project: quantifying the required time and budget, assessing and weighing risks, setting up the project documentation and organising resources; b. monitoring and managing activities with regard to budget, time, quality, information and organisation; c. task and process oriented communication; d. supervising employees, stimulating collaboration and delegating tasks; e. communicating and collaborating with others in a multicultural, international and/or multidisciplinary environment.

Block 9 and 10 / Semester 5 or Block 11 and 12 / Semester 6											
Specific HZ minor code	**Title:** Minor, see HZ Minor Catalogue or www.kiesopmaat.nl					**Number of study credits: 30**	**Number of contact hours: 2 per student**		**Mandatory**	**Teaching language: English**	
Conditions for course participation: Propaedeutic phase and 45 ECTS of the year 2 courses, see article 2.2.8											
Conditions for test participation: None											
Brief description of course content: Students can take a minor at the HZ University of Applied Sciences, at other Dutch Universities or at HZ partner Universities abroad. More information can be found at https://hz.nl/en/secure/for-students/minors											
Compulsory literature: None											
Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
Not Applicable						variable	variable			variable	variable	variable	variable

Semester 7						
CU72029V1	**Title:** Free Composition Course 6	**Number of study credits: 2.5**	**Number of contact hours: 0**	**Mandatory**	**Teaching language: English**	
Conditions for course participation: None						
Conditions for test participation: None						
Brief description of course content: The educational programme of a study programme contains a free composition space of minimally 2.5 academic credits in each academic year. The student is allowed to earn FCC credits with extracurricular activities such as: management activities, informational and promotional activities, cultural activities, instructional activities, project activities or training activities. The student will submit proposals for the free composition space to the SCC or FCC assessor prior to the activity. Afterwards, the SCC or FCC assessor will assess if the activity was performed in a satisfactory manner. Further details regarding the content and related criteria can be found in last version of the Student Manual HZ Personality, HZ University of Applied Sciences.						
Compulsory literature: None						

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01		x		x		Portfolio	LD-8.e.1	100%	Ok	3	4	5	6

Block 13 and 14 / Semester 7					
CU72028V1	**Title:** Focus on future: analysing strategic innovations	**Number of study credits: 27.5**	**Number of contact hours: 80***	**Mandatory**	**Teaching language: English**
Conditions for course participation: Propaedeutic phase and at least the minor or the internship					
Conditions for test participation: None					
Brief description of course content: Change and innovation is a constant factor in business. During this semester students will keep on working on their personal development by focussing on the strategic challenges and opportunities that arise from these changes and innovations. Students will build a portfolio providing proof that they are capable of working and behaving as a professional while working on and creating an advisory report or business plan for a company. The assignments from these companies will be provided by the HZ University of Applied sciences and will be linked either to Asset Management or Sustainability & Circular Economy. Students will be in charge of their time management and organising their project. Besides the project assignment, the students will have scheduled classes that will help them gain knowledge and skills regarding specific topics to either Asset Management or Sustainability & Circular Economy. Furthermore there are classes that are scheduled for all students to increase their knowledge on general topics such as contract strategies and programming in the statistical program "R". During the entire semester students will have group meetings with a coach that offers them guidance in their professionalization and will help them find their way to project-specific knowledge. Note: Take into account article 2.2.7 of this regulation					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01			X	X		Criterium referenced interview	Design, Advice, Research, Professionalization	100%	5.5	4	6	14	16

Semester 8 or Semester 9					
CU72030V1	**Title:** Graduation Project	**Number of study credits: 30**	**Number of contact hours: 8**	**Mandatory**	**Teaching language: English**
Conditions for course participation: See article 2.2.11 of this document					
Conditions for test participation: See article 2.2.11 of this document for ECTS requirements and graduation study guide for report and portfolio requirements					
Brief description of course content: During this final project the students will show their competence as an Industrial Engineering & Management professional during their final project. The students will find a company and an authentic project assignment for this final part of their study. During this project they will show that they obtained enough skills and knowledge to take on real-life assignments independently and to develop a business improvement report. They will reflect on their behaviour and performance and present their end work in a professional portfolio.					
Compulsory literature: None					

Test code	**Format** *Verbal/Written/Other Individually/Group*					**Assessment type**	**Content** *Link with learning outcomes*	**Weighting Factor (%)**	**Minimum score**	**Planning test in week**	**Inspection of work in week**	**Resit scheduled in week**	**Inspection of resit in week**
	V	**W**	**O**	**I**	**G**								
TOETS01	X	X		X		Criterium-referenced interview (with reference to graduation report and portfolio submitted beforehand)	Analysis, Design, Advice, Control, Management, Realisation, Research, Professionalization	100%	5.5	26 (S8) / 4 (S9)	26 (S8) / 4 (S9)	35 (S8) / 8 (S9)	35 (S8) / 8 (S9)

2.2.6 ***HZ Personality*** (article 3.12 CER HZ Ba ft)

The curriculum reserves 10 study credits (ECTS) for HZ Personality. HZ Personality is spread over the curriculum as much as possible. With this learning pathway, HZ gives students space to personalize their own development during their studies, increases the possibilities for domain-transcending exploration and stimulates broad social engagement.

2.2.7 ***Specialisations*** (article 3.10 CER HZ Ba ft)

No graduation specialisations applicable in the programme.

2.2.8 ***Internship*** (article 3.9 CER HZ Ba ft)

Students who want to take part in the internship phase of the study programme must meet the following conditions:

- The student must have their propaedeutic phase and 45 EC of all Y2 courses to be admissible for the internship.
- The student must have an approved and signed work placement contract.
- Students who need to enter a construction site are strongly advised to have a valid VCA certificate. If you do not have a VCA-certificate you are not allowed access a construction site in the Netherlands, this can be essential to acquire the competencies linked to the internship.

The maximum period in which students are allowed to work on the same internship project:

- The period in which a specific internship project is worked out is 1 semester, with a maximum extension of 1 semester and can only be started at the beginning of semester 1 or at the beginning of semester 3. The application procedure and deadlines can be found in the IE&M internship guide.

Additional conditions for work placements (Internships) abroad (outside the Netherlands):

- A maximum amount of 15 EC of resits in the semester of internship is allowed. If the student has more than 15EC of resits in the simultaneous running semester of the internship, the student is not allowed to attend the internship abroad since this will cause difficulties in attending the resits. See the OER HZ for additional requirements.

2.2.9 ***Minor*** (article 3.8 CER HZ Ba ft)

Industrial Engineering and Management follows the HZ (CER article 3.8) for the minor application process and registration requirements (see also the HZ Minor Guide https://learn.hz.nl/course/view.php?id=13203#section-1)**Error! Hyperlink reference not valid.**. The contents of HZ minors and other national minors can be found at www.kiesopmaat.nl, the international minors are coordinated through the HZ International Office.

Students can take a minor in either semester 5 or 6 depending on their personal preference and internship planning.

2.2.10 ***Participation in international exchange programme*** (article 4.5 CER HZ Ba ft)
The study programme does not have any additional conditions for students to participate in an international exchange programme.

2.2.11 ***Graduation*** (article 3.9 CER HZ Ba ft)
In order to participate in the Industrial Engineering and Management (IEM) programme graduation phase, students must:

a. have obtained at least 177.5 EC when starting their graduation at the start of the semester
b. carry out the graduation project at an organisation within the IEM field of expertise
c. submit a sufficient "Start document" and obtain the "Go"-status in OnStage within 4 weeks after the formal start date of the semester. If failed to do so, the student will have to delay the start of the graduation project till the start date of the next semester
d. submit a sufficient "Research Proposal" and obtain the "Go"-status within 10 weeks after the formal start date of the semester. If failed to do so, the student will have to find a new graduation organisation and assignment and the start of this new graduation project will be delayed till the start date of the next semester
e. have obtained all preceding 210 EC from the IE&M program before the graduation presentation and defence takes place for final assessment, as defined in the course programme.

More information (study guide and deadlines, etc.) is provided in the Learn page of the Graduation Industrial Engineering and Management of your graduation year. When the student fails the two permitted exam attempts within one semester for the final graduation report and portfolio, he/she may continue this specific graduation project with a maximum extension of 1 semester and two more permitted exam attempts.

2.2.12 Transition arrangement (art. 6.2 paragraph 11 HZ CER)
Transitional provisions are applicable: tests of a deleted course will be offered twice in the first study year, after the curriculum has been modified. In principle, new manuals, guides, requirements, et cetera are effective immediately.

2.3 Study recommendation

2.3.1. ***Conditions for registration for programme after NBSA*** (article 8.1, paragraph 9 HZ CER Ba ft)
Students with a formal negative study advice from the HZ Exam Committee are not allowed for any new enrolment in the bachelor program Industrial Engineering & Management, part-time and full-time, and the Associate Degree Industrial Engineering & Management, of the HZ within three years after the negative study advice.

2.4 Experiment (article 9.4 CER HZ ba ft)

2.4.1 Register for courses

Students in the Industrial Engineering & Management full-time program have to enroll themselves via Osiris Student for learning activities of a course.

- An overview of these learning activities is being published via Osiris Student;
- The rule mentioned above is not valid for all students in the cohort 2019, 2018 and 2017; These students will be automatically enrolled;
- The student has to be enrolled at latest the week before the activity starts;
- If students have failed to enroll, they have no access to learning materials;
- A student cannot terminate his enrollment once learning activities have started.

2.4.2 Register for tests

Students in the Industrial Engineering & Management full-time program have to enroll themselves via Osiris Student for exams.

- Regular exams: Students need to enroll for regular exams (first attempt) at the beginning of the block. Students in the cohort 2019, 2018 and 2017 will be automatically enrolled for regular exams.
- Re-sit exams:
  - To participate in a re-sit (second and further attempts), students must enroll themselves before the end of the 4th week of the block in which the exam or re-sit has been planned based on this Implementation Regulation; Students in the cohort 2019, 2018 and 2017 will be automatically enrolled unless a student wants to participate in an exam or re-sit in order to improve an already achieved sufficient result for a course;
  - If a student who did not pass the first attempt, does not enroll for the re-sit, will be graded 'ND' (did not participate);
- Students who already passed a test are allowed to retake that test one more time to obtain a better result. If the test type is an oral assessment, assignment, presentation, portfolio or criterium referenced interview, a new topic has to be selected by the student and approved by teacher at least four weeks prior to the date of the re-sit. This does not apply for internship and graduation (see articles 2.2.8 and 2.2.11).

CHAPTER 3 ESTABLISHMENT

3.1.1 The duration of the implementation regulations is the same as the duration of the HZ Education and Examination Regulations Bachelor programme full-time 2022-2023.

3.1.2 These Course and Examination Regulations were established by the Executive Board on 05/07/2022.