THE IMPLEMENTATION REGULATIONS

2016-2017

MASTER OF SCIENCE
CIVIL ENGINEERING

DELFT UNIVERSITY OF TECHNOLOGY

Section 1 – Compiling the study programme

Article 1 – The study load

The study load for the Master's degree course is 120 credits. None of the components of the course may have formed part of the Bachelor's degree course in Civil Engineering.

Teaching and Education Regulations MSc Article 8 subsection 3:
"It is not permitted for any subject in the study programme to have been part of the Bachelor's degree programme on the basis of which the student was admitted to the degree programme. If a compulsory subject was already completed in the aforementioned Bachelor's degree programme, the board of examiners will designate an alternative subject in its place. If an elective subject in the study programme was already completed in the aforementioned Bachelor's degree programme, the student will choose an alternative elective subject."

Article 2 – Tracks, specialisations and annotations

1. The course comprises the following tracks:
   - Structural Engineering
   - Building Engineering
   - Hydraulic Engineering
   - Water Management
   - Transport and Planning
   - Geo-Engineering
   - Geoscience and Remote Sensing
   - Environmental Engineering
   - the Erasmus Mundus programme: Coastal and Marine Engineering and Management

2. The Erasmus Mundus MSc programme Coastal and Marine Engineering and Management is subject to the programme-specific "Implementations Regulations for the MSc Degree CoMEM". These regulations replace the present Implementation Regulations for the MSc degree in Civil Engineering in the case of CoMEM only.

3. Within a track the student has to complete the common compulsory block. Furthermore the student can choose for one of the specialisations as mentioned in Articles 5 to 12 or for a free specialisation. The student makes sure he will ask for approval in time as is stipulated in Article 4 subsection 1.

4. Within a track or within a specialisation the student may opt for the following annotations mentioned in Articles 13A – 13G:
   - Technology in Sustainable Development
   - Entrepreneurship
   - Urban Planning and Engineering ("Stadsingenieur")
   - Infrastructure Planning and Environmental Engineering ("Infrastructuur en milieu")
   - Integral Design Management
   - Rail
   - Dynamics of Structures

Article 3 – The composition

1. The study programme tracks are compiled in the following way:
   a. 4 credits: the subject Philosophy, Technology Assessment and Ethics for CT (WM0312CIE) or the subject Climate Change: Science & Ethics (CIE4510). CIE4510 is obligated for Geoscience and Remote Sensing or Environmental Engineering students.
   b. 56 credits[1]: track-linked subjects belonging to the chosen track. The track-linked subjects may be subdivided into those that are general track-linked subjects (the common compulsory block) and those that belong to a specialisation as stipulated in Articles 5 to 12 or a free specialisation.
   Track-linked credits, exceeding 56 credits, will be considered as credits achieved for electives mentioned under c.
   c. 20 credits as follows[2]:
   * 20 credits electives. The student has to choose 10 credits offered in conjunction with the degree course. For the other credits the student may choose:
   - all subjects offered in conjunction with the degree course,

[1] 55 or 57 credits for Environmental Engineering.
[2] Not for Building Engineering students, see Article 6 subsection 1.

- all subjects offered in conjunction with other Master's degree courses at a Dutch university or at an international university which TU Delft has an exchange contract with,
- the specialisation subjects included in the list "keuzelijst specialisatievakken" as intended in Article 3 of the Implementation Regulations for the Bachelor's degree course in Civil Engineering at Delft University of Technology, as far as they are considered to be convergence subjects,
- interfacultary Master's-level electives at Delft University of Technology with a "WM-code" to a maximum of 6 credits, however language and skills subjects are **not** allowed within the examination programme. Language and skill subjects can only be part of the extracurricular section of the diploma supplement.[3]

Before any other subjects can be studied the approval of the board of examiners is required.

OR

* two of the possibilities listed below:
  - 10 credits: Internship (CIE4040-09)
  - 10 credits: Multidisciplinary Project (CIE4061-09)
  - 10 credits: electives. What is determined above for the other electives is similarly applicable.
  - 10 credits: Additional Master Thesis Project (CIE5050-09). The Additional Master Thesis Project may or may not be related to the Master Thesis Project mentioned under d but it may, in any case, be separately distinguished.

d. 40 credits: a track-linked Master Thesis Project (CIE5060-09). The Master Thesis Project consists of a final project, a thesis, a summary of the thesis and a final presentation. The project is subject to a strict planning and time table; specific dates and deadlines need to be set for the evaluation(s) and the final presentation of the project. The planning will be monitored by the graduation coordinator.

2. In Article 21 as well as in the Rules and Guidelines laid down by the board of examiners, further stipulations have been laid down in relation to the Internship, the Multidisciplinary Project, the Additional Master Thesis Project and the Master Thesis Project.

Article 4 – Registering the tracks and compiling the examination programme

1. At the beginning of his/her study the student must register himself/herself with Studielink as a prospective graduate of the track of his/her choice. After that the student notifies the graduation coordinator with the specialisation he/she has chosen. As soon as possible, but no later than after twelve months after the beginning, the track-linked subjects of his/her examination programme will be chosen in consultation with the coordinator. In case of a free specialisation the specialisation will preferably also be approved by a Civil Engineering professor, involved in the specialisation's topic.

2. In accordance with what is determined in subsection 1, but in any case before the Master Thesis Project or the Additional Master Thesis Project is started on, the student must draw up his/her entire examination programme before then presenting it – together with the assessment committee's compilation – to the board of examiners for approval.

3. Any amendments made to the approved examination programme or to the approved assessment committee should be presented to the board of examiners.

4. Students who opt for an annotation mentioned in Articles 13A – 12G must also have the discussion mentioned in subsection 1 with the referent, coordinator or programme director for the chosen annotation.

Article 5 – The Structural Engineering track

1. The Structural Engineering track has six specialisations:
   - Structural Mechanics
   - Concrete Structures
   - Steel and Timber Construction
   - Materials and Environment
   - Road and Railway Engineering
   - Hydraulic Structures

   The compulsory programme for each specialisation consists of a common Structural Engineering block of 32 credits and an additional block of 24 credits.

   In addition to the presented programme students must meet the following requirements:
   - Students with a relevant foreign Bachelor of Science degree will, if required by intake, do CIE4145-09 (Dynamics and Introduction to Continuum Mechanics) as a compulsory elective subject.
   - Students who have not done CT3150 or CTB3335 (Concrete Structures 2) in the Bachelor's phase will have to do CIE3150 as a compulsory elective subject.

[3] This means that subjects like writing, oral presentation, English and Dutch are not allowed within the examination programme.

- Students who have not done CT3109-09 or CTB3330 (Structural Mechanics 4) in the Bachelor's phase are strongly advised to take CIE3109-09 as an elective subject.

2. Common compulsory block Structural Engineering
   All students opting for the track Structural Engineering must complete the following subjects adding up to 32 credits:

code	subject	ECs
CIE4100	Materials and Ecological Engineering	4
CIE4110	Timber and Timber Structures 1	4
CIE4115	Steel Structures 2	4
CIE4121	Steel Structures 3	4
CIE4140	Structural Dynamics	4
CIE4160	Prestressed Concrete	4
CIE4180	Plates and Slabs	4
CIE4190	Analysis of Slender Structures	4

3. Additional block Structural Mechanics
   Students who have opted for the specialisation Structural Mechanics must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4130	Probabilistic Design and Risk Management	4
CIE4143	Shell Analysis, Theory and Application	4
CIE4150	Plastic Analysis of Structures	4
CIE5123	Introduction to the Finite Element Method	4
CIE5145	Random Vibrations	4
CIE5148	Computational Modelling of Structures	4

4. Additional block Concrete Structures
   Students who have opted for the specialisation Concrete Structures must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4281	Building Structures 2	4
CIE5110	Concrete – Science and Technology	4
CIE5127	Concrete Bridges	4
CIE5130	Capita Selecta Concrete Structures	4
CIE5148	Computational Modelling of Structures	4

5. Additional block Steel and Timber Construction
   Students who have opted for the specialisation Steel and Timber Construction must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4125	Structural Design - Case Study Steel, Timber or FRP	3
CIE5122	Capita Selecta Steel and Aluminium Structures	4
CIE5124	Timber and Timber Structures 2	4
CIE5125	Steel Bridges	4
CIE5126	Fatigue	3
CIE5128	Fibre-Reinforced Polymer (FRP) Structures	3
CIE5131	Fire Safety Design	3

6. Additional block Materials and Environment
   Students who have opted for the specialisation Materials and Environment must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4030	Methodology for Scientific Research	3
CIE5100	Repair and Maintenance of Construction Materials	4
CIE5102	Forensic Building Materials Engineering	3
CIE5110	Concrete – Science and Technology	4
CIE5126	Fatigue	3
CIE5130	Capita Selecta Concrete Structures	4
CIE5146	Micromechanics and Computational Modelling of Building Materials	3

7. Additional block Road and Railway Engineering
   Students who have opted for the specialisation Road and Railway Engineering must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4860	Structural Pavement Design	6
CIE4870	Structural Design of Railway Track	4
CIE4880	Road Paving Materials, Laboratory Experiment included	7
CIE5850	Road Construction	3
CIE5871	Capita Selecta Railway and Road Structures	4

8. Additional block Hydraulic Structures
   Students who have opted for the specialisation Hydraulic Structures must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE3310-09[4]	Open Channel Flow	4
CIE3330[5]	Hydraulic Structures 1	4
CIE4130	Probabilistic Design and Risk Management	4
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4310	Bed, Bank and Shore Protection	4
CIE4345[6]	River Engineering	4

9. Structural Engineering electives
   All subjects listed above can be chosen as electives. In addition the following subjects are also available:

code	subject	ECs
CIE4510	Climate Change: Science and Ethics	4

Of particular interest for Structural Mechanics students:

CIE4353	Continuum Mechanics	6
CIE5142	Computational Methods in Non-linear Solid Mechanics	3
CIE5144	Stability of Structures	3

Of particular interest for Hydraulic Structures students:

CIE4305	Coastal Dynamics 1	6
CIE4325	Ocean Waves	6
CIE5304	Waterpower Engineering	3
CIE5310	Probabilistic Design in Hydraulic Engineering	3
CIE5313	Hydraulic Structures 2	3
CIE5314	Flood Defences	3

For foreign students only:

CIE4145-09	Dynamics and Introduction to Continuum Mechanics	4

Article 6 – The Building Engineering track

1. The Building Engineering track has two specialisations:
   - Building Technology and Physics
   - Structural Design

   The compulsory programme for each specialisation consists of a common Building Engineering block of 17 credits and an additional block of 39 credits.

   In addition to the presented programme students must meet the following requirements:
   - Contrary to Article 3 subsection 1c Building Engineering students must follow AR0026 (Mega, 12 credits) in collaboration with the Architectural department instead of CT4061-09 (Multidisciplinary Project). In addition, students are free to choose for Internship, Additional Thesis and/or electives adding up to 20 credits.

[4] Not if CT3310-09 has been completed in the Bachelor's phase
[5] Not if CT3330 has been completed in the Bachelor's phase
[6] Not if CT3340 or CIE4345MI has been completed in the Bachelor's phase

- Students who have not done CT3221 (Building Physics and Building Technology) or CTB3345 (Building Physics and Facades) in the Bachelor's phase will have to do CIE3345 (Introduction Building Physics and Facades) as a compulsory elective subject.

2. Common compulsory block Building Engineering
All students opting for the track Structural Engineering must complete the following subjects adding up to 17 credits:

code	subject	ECs
CIE4202	Architectural History of Buildings	4
CIE4215	Façade Design Plus	3
CIE4240	Forensic Structural Engineering	3
CIE5981	Forms of Collaboration in Civil Engineering	4
ID4010	Design Theory and Methodology	3

3. Additional block Building Technology and Physics
Students who have opted for the specialisation Building Technology and Physics must complete the following subjects adding up to 33 credits:

code	subject	ECs
CIE4225	Advanced & Applied Building Physics	6
CIE5100	Repair and Maintenance of Construction Materials	4
CIE5131	Fire Safety Design	3
AR0115	Technoledge Facade Design	6
AR0531	Innovation and Sustainability (theory)	6
Extra electives, as mentioned in Article 3 subsection 1c		8

4. Additional block Structural Design
Students who have opted for the specialisation Structural Design must complete the following subjects adding up to 33 credits:

code	subject	ECs
CIE3109-09[7]	Structural Mechanics 4	4
CIE3150[8]	Concrete Structures 2	4
CIE4115	Steel Structures 2	4
CIE4190	Analysis of Slender Structures	4
CIE4281	Building Structures 2	4
CIE5251-09	Structural Design, Special Structures	5
choose one out of:		
CIE4110	Timber and Timber Structures 1	4
CIE4285	Structural Glass	3
Extra electives, from the list below		4 or 5

If one or more of the above-mentioned subjects CIE3109-09, CIE3150, CIE4115 and CIE4190 has been done in the Bachelor's phase, the student may choose from:

code	subject	ECs
CIE4121	Steel Structures 3	4
CIE4125	Structural Design - Case Study Steel, Timber or FRP	3
CIE4140	Structural Dynamics	4
CIE4160	Prestressed Concrete	4
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4362	Soil Structure Interaction	3
CIE4363	Deep Excavations	4
CIE5124	Timber and Timber Structures 2	4
CIE5125	Steel Bridges	4
CIE5127	Concrete Bridges	4
CIE5131	Fire Safety Design	3
CIE5148	Computational Modelling of Structures	4

Article 7 – The Hydraulic Engineering track

1. The Hydraulic Engineering track has four specialisations:
- Coastal Engineering

[7] Not if CT3109-09 has been completed in the Bachelor's phase
[8] Not if CT3150 has been completed in the Bachelor's phase

- Rivers, Ports and Waterways, with fields River Engineering, Dredging Engineering and Ports and Waterways
- Environmental Fluid Mechanics
- Hydraulic Structures and Flood Risk, with fields Hydraulic Structures and Flood Risk

and one specialisation in a double degree programme with the National University of Singapore (NUS), mentioned in subsection 9:
- Hydraulic Engineering and Water Resources Management (the TUD-NUS specialisation)

The compulsory programme for each specialisation, except for the TUD-NUS specialisation, consists of a common Hydraulic Engineering block of 18 credits (or 14 credits in the case that River Engineering (CT3340 or CT3364 or CIE4345MI) has been completed in the Bachelor's phase), an additional specialisation block and Hydraulic Engineering electives adding up to a total of 56 track-linked credits.

In addition to the presented programme students must meet the following requirements:
- Students with a relevant foreign Bachelor of Science degree who opt for the field Hydraulic Structures of the specialisation Hydraulic Structures and Flood Risk, will, if required by intake, do Dynamics and Introduction to Continuum Mechanics (CIE4145-09) as a compulsory elective subject.
- Students who have not completed Open Channel Flow (CT3310-09 or CTB3350) in the Bachelor's phase will have to take CIE3310-09 as a compulsory elective subject.
- Students who have not done Hydraulic Structures 1 (CT3330 or CTB3355) in the Bachelor's phase will have to include CIE3330 as a compulsory elective subject.

2. Common compulsory block Hydraulic Engineering
All students opting for the track Hydraulic Engineering must complete the following subjects adding up to 18 credits:

code	subject	ECs
CIE4130	Probabilistic Design and Risk Management	4
CIE4305	Coastal Dynamics 1	6
CIE4310	Bed, Bank and Shore Protection	4
CIE4345[9]	River Engineering	4

3. Additional block Coastal Engineering
Students who have opted for the specialisation Coastal Engineering must complete the following subjects adding up to 23 credits:

code	subject	ECs
CIE4309	Coastal Dynamics 2	5
CIE4325	Ocean Waves	6
CIE4330	Ports and Waterways 1	4
CIE4340	Computational Modelling of Flow and Transport	4
CIE5308	Breakwaters and Closure Dams	4

4. Additional block Rivers, Ports and Waterways
Students who have opted for the specialisation Rivers, Ports and Waterways must complete the following subjects adding up to 26 credits (field River Engineering 25 credits):

code	subject	ECs
CIE4325	Ocean Waves	6
CIE4330	Ports and Waterways 1	4
CIE4340	Computational Modelling of Flow and Transport	4
CIE5300	Dredging Technology	4
CIE5311	River Dynamics	4
field River Engineering:		
CIE5315	Computational Hydraulics	3
field Dredging Engineering:		
OE44040	Dredging Processes I	4
field Ports and Waterways:		
CIE5306	Ports and Waterways 2	4

5. Additional block Environmental Fluid Mechanics

[9] Not if CT3340 or CIE4345MI has been completed in the Bachelor's phase

Students who have opted for the specialisation Environmental Fluid Mechanics must complete the following subjects adding up to 22 credits:

code	subject	ECs
CIE4325	Ocean Waves	6
CIE4340	Computational Modelling of Flow and Transport	4
CIE5302	Stratified Flows	3
CIE5312	Turbulence in Hydraulics	3
CIE5315	Computational Hydraulics	3
CIE5317	Physical Oceanography	3

6. Additional block Hydraulic Structures and Flood Risk

Students who have opted for the specialisation Hydraulic Structures and Flood Risk must complete the following subjects adding up to 26 credits (field Hydraulic Structures 29 credits):

code	subject	ECs
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4325	Ocean Waves	6
CIE5313	Hydraulic Structures 2	3

field Hydraulic Structures:

CIE3109-09[10]	Structural Mechanics 4	4
CIE3150[11]	Concrete Structures 2	4
CIE4140	Structural Dynamics	4
CIE4160	Prestressed Concrete	4

field Flood Risk:

CIE3325[12]	Mechanics and Transport by Flow in Porous Media	4
CIE4367-16	Embankments and Geo-synthetics	3
CIE5310	Probabilistic Design in Hydraulic Engineering	3
CIE5314	Flood Defences	3

7. Hydraulic Engineering electives

Apart from what is stipulated in subsections 2 to 7, Hydraulic Engineering students should make sure they get - depending on their specialisation and in consultation with the graduation professor - a total of 56 track-linked credits by choosing from the above listed subjects or from the list below:

code	subject	ECs
CIE3310-09[13]	Open Channel Flow	4
CIE3330[14]	Hydraulic Structures 1	4
CIE4030	Methodology for Scientific Research	3
CIE4115[15]	Steel Structures 2	4
CIE4145-09[16]	Dynamics and Introduction to Continuum Mechanics	4
CIE4180	Plates and Slabs	4
CIE4190[17]	Analysis of Slender Structures	4
CIE4308	Sediment Dynamics	3
CIE4361	Behaviour of Soils and Rocks	6
CIE4362	Soil-Structure Interaction	3
CIE4363	Deep Excavations	4
CIE4365-16	Modelling Coupled Processes for Engineering Applications	5
CIE4366	Numerical Modelling in Geo-Engineering	6
CIE4390	Geo-risk Management	3
CIE4400	Water Quality Modelling	4
CIE4410	Water Systems, People and Society	4
CIE4420[18]	Geohydrology 1	4
CIE4431	Hydrological Modelling	4

[10] Not if CT3109-09 has been completed in the Bachelor's phase
[11] Not if CT3150 has been completed in the Bachelor's phase
[12] Not if CTB3390 has been completed in the Bachelor's phase
[13] Not if CT3310-09 has been completed in the Bachelor's phase
[14] Not if CT3330 has been completed in the Bachelor's phase
[15] Not if CT3121 has been completed in the Bachelor's phase
[16] For foreign students only
[17] Not if CT3110 has been completed in the Bachelor's phase
[18] Not combined with CIE3325

CIE4440	Hydrological Processes and Measurements	4
CIE4450	Integrated Water Management	4
CIE4460	Polders and Flood Control	4
CIE4480	Integral Systems Design	4
CIE4491	Urban Drainage and Watermanagement	4
CIE4495-13	Fundamentals of Water Treatment	4
CIE4760	Assessment of transport infrastructure and systems	6
CIE4780	Trending Topics in Geo-Engineering	4
CIE5304	Waterpower Engineering	3
CIE5305	Bored and Immersed Tunnels	4
CIE5307	Coastal Zone Management	3
CIE5318	Fieldwork Hydraulic Engineering	4
CIE5320	Site Characterisation, Testing and Physical Model	6
CIE5340	Soil Dynamics	3
CIE5401	Spatial Tools in Water Resources Management	3
CIE5421	Water and Health	4
CIE5440	Geohydrology 2	2
CIE5450	Hydrology of Catchments, Rivers and Deltas	4
CIE5471	Hydrological and Ecological Fieldwork in River Systems	4
CIE5490	Operational Water Management	4
CIE5500	Water Law and Organisation	4
CIE5510	Water Management in Urban Areas	4
CIE5541	Urban Drainage Monitoring and Modelling	3
CIE5560	Civil Engineering in Developing Countries	4
CIE5580	Ecology and Geomorphology	5
CIE5741	Trenchless Technologies	4
CIE5981	Forms of Collaboration in Civil Engineering	4
AES1630	Engineering Geology	4
AES1730[19]	Introduction to Geotechnical Engineering	3
AES1750-09	Geology for Engineers	4
CME2300	Financial Engineering	4
OE44030	Offshore Geotechnical Engineering	4
OE44035	Dredging Pumps and Slurry Transport	4
OE44040	Dredging Processes I	4

and from the following subjects offered by the National University of Singapore:

code	subject	ECs
CE5307 (NUS)	Wave Hydrodynamics and Physical Oceanography	6
CE5308 (NUS)	Coastal Processes and Sediment Transport	6
CE5310 (NUS)	Hydro Informatics	6
CE5311 (NUS)	Environmental Modelling with Computers	6
CE5312 (NUS)	River Mechanics	6
CE5603 (NUS)	Engineering Economics and Project Evaluation	6
CE5710 (NUS)	Design of Floating Structures	6
CE5711 (NUS)	Offshore Moorings and Risers	6
ESE4001 (NUS)	Basic Environmental Science and Engineering	6
ESE5402 (NUS)	Water Treatment Processes	6
ESE5601 (NUS)	Environmental Risk Assessment	6
ESE5602 (NUS)	Environmental Management System	6
ESE5901 (NUS)	Environmental Technology	6
IE5303 (NUS)	Decision Analysis	6

Other courses than the ones listed above may be acknowledged as an elective only after consultation with and explicit approval of the graduation professor.

8. Hydraulic Engineering and Water Resources Management (the TUD-NUS HE programme)

The Hydraulic Engineering and Water Resources Management programme holds a mixture of subjects of Delft University of Technology (TUD) and the National University of Singapore (NUS).
This TUD-NUS HE programme consists of a common compulsory block of 44 credits (or 46 credits if River Mechanics (CE5312 (NUS) is taken instead of River Engineering (CIE4345); or 40 credits if River Engineering (CT3364 or CT3340 or CIE4345MI) has been completed in the Bachelor's phase) and electives adding up to a total of 72 track-linked credits.

[19] Not for students who completed a soil mechanics subject in their Bachelor's degree course.

Common compulsory block TUD-NUS HE programme
All students opting for the TUD-NUS HE programme must complete the following subjects adding up to 40, 44 or 46 credits:

code	subject	ECs
CIE4130	Probabilistic Design and Risk Management	4
CIE4310	Bed, Bank and Shore Protection	4
CIE4330	Ports and Waterways 1	4
CIE4340	Computational Modelling of Flow and Transport	4
CIE4345[20]	River Engineering	4
CE5307 (NUS)	Wave Hydrodynamics and Physical Oceanography	6
CE5308 (NUS)[21]	Coastal Processes and Sediment Transport	6
CE5310 (NUS)	Hydro Informatics	6
CE5311 (NUS)	Environmental Modelling with Computers	6
CE5312 (NUS)[22]	River Mechanics	6

TUD-NUS HE programme electives
TUD-NUS HE programme students should make sure they get a total of 72 track-linked credits by choosing from the subjects mentioned in subsections 3 up to and including 8 or from the list below:

code	Subject	EC's
CE5603 (NUS)	Engineering Economics and Project Evaluation	6
CE5710 (NUS)	Design of Floating Structures	6
CE5711 (NUS)	Offshore Moorings and Risers	6
ESE4001 (NUS)	Basic Environmental Science and Engineering	6
ESE5402 (NUS)	Water Treatment Processes	6
ESE5601 (NUS)	Environmental Risk Assessment	6
ESE5602 (NUS)	Environmental Management System	6
ESE5901 (NUS)	Environmental Technology	6
IE5303 (NUS)	Decision Analysis	6

Article 8 – The Water Management track

1. The Water Management track has three specialisations:
   - Hydrology
   - Water Resources Management
   - Sanitary Engineering

   The Water Management track is a Campus degree programme as well as an online degree programme. Each online course is given parallel to the Campus course, within the same period, ending with exams together with Campus students.

   The compulsory programme for each specialisation consists of a common compulsory Water Management block of 16 credits and 40 credits Water Management specialisation electives.

   Students with a Dutch higher vocational institute Bachelor degree ("HBO") must complete
   CIE3410-09, Water Control, 4 ECs as a Water Management specialisation elective
   and
   AES1730, Introduction to Geotechnical Engineering, 3 ECs, as a free elective.

2. Common compulsory block Water Management
   All students opting for the track Water Management must complete the following subjects adding up to 16 credits:

code	subject	ECs
CIE4440	Hydrological Processes and Measurements	4
CIE4450	Integrated Water Management	4
CIE4491	Urban Drainage and Water Management	4
CIE4495-13	Fundamentals of Water Treatment	4

3. Water Management specialisation electives
   Depending on their specialisation and in consultation with the chair of the assessment committee Water Management students are required to complete a selection of the following electives adding up to 40 credits from the following five categories.

[20] Not if CT3364 or CIE4345MI has been completed in the Bachelor's phase
[21] Not combined with CIE4305
[22] Not combined with CIE4345

Electives from the categories b, c, d and e can only be included in this selection upon approval from the graduation coordinator and the Board of Examiners.

Category a:

code	subject	ECs
CIE3365-16[23]	Introduction to Water Treatment	4
CIE3410-09[24]	Water Control	4
CIE4400	Water Quality Modelling	4
CIE4410	Water Systems, People and Society	4
CIE4415	Design of Drinking Water and Wastewater Treatment Plants	5
CIE4420	Geohydrology 1	4
CIE4431	Hydrological Modelling	4
CIE4460	Polders and Flood Control	4
CIE4486	Industry Water	4
CIE4703[25]	Water Treatment	6
CIE5401	Spatial Tools in Water Resources Management	3
CIE5421	Water and Health	4
CIE5440	Geohydrology 2	4
CIE5450	Hydrology of Catchments, Rivers and Deltas	4
CIE5471	Hydrological and Ecological Fieldwork in River Systems	4
CIE5490	Operational Water Management	4
CIE5500	Water Law and Organisation	3
CIE5510	Water Management in Urban Areas	4
CIE5541	Urban Drainage Monitoring and Modelling	3
CIE5550	Pumping Stations and Transport Pipelines	4
CIE5560	Civil Engineering in Developing Countries	4
CIE5580	Ecology and Geomorphology	5

Category b:
The Hydraulic Engineering subjects mentioned in Article 7 subsections 2 to 8.

Category c:
Master of Science subjects offered in the Faculty Applied Sciences.

Category d:
The Geoscience and Remote Sensing subjects mentioned in Article 11.

Category e:
The following subjects offered in the Faculty of Architecture:

code	subject	ECs
BK7250	Sustainable Urbanism	3
AR1U130	Sustainable Urban Engineering of Territory	4

4. Hydraulic Engineering and Water Resources Management (the TUD-NUS WM programme):

The Hydraulic Engineering and Water Resources Management programme holds a mixture of subjects of Delft University of Technology (TUD) and the National University of Singapore (NUS).

The TUD-NUS WM programme consists of a common compulsory block of 48 credits and electives adding up to a total of 24 credits.

Common compulsory block TUD-NUS programme
All students opting for the TUD-NUS programme Water Management must complete the following subjects adding up to 48 credits:

code	subject	ECs
CIE4440	Hydrological processes and measurements	4
CIE4450	Integrated Water Management	4
CIE4491	Urban drainage and Watermanagement	4
CIE4495-13	Fundamentals of Water Treatment	4

and choose four out of:

CE5307NUS	Wave Hydrodynamics and Physical Oceanography	6
CE5308NUS	Coastal Engineering and Sediment Transport	6

[23] Not if an equivalent subject has been completed in the Bachelor's phase
[24] Idem as 24
[25] See article 23 for a transition ruling for CIE4475 and CIE4485.

CE5310NUS	Hydroinformatics	6
CE5311NUS	Environmental Modelling with Computers	6
CE5312NUS[26]	River Mechanics	6

and choose 2 subjects with a total of at least 8 credits from the above in subsection 3 listed Water Management subjects.

TUD-NUS WM programme electives
TUD-NUS WM programme students select for 24 credits from subjects as listed under subsection 3, categories a to e. These specialisation electives are chosen in consultation with the chairperson of the assessment committee.

Article 9 – The Transport and Planning track

The Transport and Planning track has one specialisation:
- Transport and Planning

Common compulsory block Transport and Planning
All students opting for the track Transport and Planning must complete the following subjects adding up to 48 credits:

code	subject	ECs
CIE4760	Assessment of transport infrastructure and systems	6
CIE4801	Transport and Spatial Modelling	6
CIE4811-09	Planning and Operations of Public Transport Systems	6
CIE4821-09	Traffic Flow Theory and Simulation	6
CIE4822-09	Traffic Management and Control	6
CIE4831-09	Empirical Analysis for Transport and Planning	6
CIE4840	Freight Transportation Systems: Analysis and Modelling	4
CIE5730	Spatial and Transport Economics	4
CIE5810-09	Traffic Safety	4

Additional block Transport and Planning
choose two out of:

CIE4872	Railway Operations and Control	4
CIE5750	Transport and Spatial Planning for urbanized regions	4
CIE5802-09	Advanced Transportation Modelling	4
CIE5803-09	Railway Traffic Management	4
CIE5804-09	Innovations in Dynamic Traffic Management	4
CIE5805	Intelligent Vehicles for Safe and Efficient Traffic: Design and Assessment	4
CIE5811	Transport Safety	4

Article 10 – The Geo-Engineering track

The Geo-Engineering track has one specialisation:
- Geo-Engineering

Common compulsory block Geo-Engineering
All students opting for the track Geo-Engineering must complete the following subjects adding up to 34 credits:

code	subject	ECs
CIE4361	Behaviour of Soils and Rocks	6
CIE4365-16	Modelling Coupled Processes for Engineering Applications	5
CIE4366	Numerical Modelling in Geo-Engineering	6
CIE4395	Risk and Variability in Geo-Engineering	4
CIE5320	Site Characterisation, Testing and Physical Modelling	6
AES1630	Engineering Geology	4
AESM1700	Consolidation of Soils	3

If the Bachelor's phase did not include the contents of the following subjects, these subjects are compulsory on the advice of the master graduation coordinator:

[26] Not combined with CIE4345

code	subject	ECs
AES1730	Introduction to Geotechnical Engineering *for students without soil mechanics and geotechnical engineering background*	4
CIE4420	Geohydrology 1 *for students who did not pass CTB3390 or AESB3340*	4

Additional block Geo-Engineering
Students are required to complete a selection of the following subjects adding up to a total of 56 track-linked credits.

code	subject	ECs
CIE4353	Continuum Mechanics	6
CIE4362	Soil-structure Interaction	3
CIE4363	Deep Excavations	4
CIE4367-16	Embankments and Geosynthetics	3
CIE4390	Geo-risk Management	3
CIE4420[27]	Geohydrology 1	4
CIE4780	Trending Topics in Geo-Engineering	4
CIE5305	Bored and Immersed Tunnels	4
CIE5340	Soil Dynamics	3
CIE5741	Trenchless Technologies	4
OE44030	Offshore Geotechnical Engineering	4
AES1501	Methods of Exploration Geophysics	3
AES1640-11	Environmental Geotechnics	4
AES1720-11	Rock Mechanics Applications	5
AES1730 [28]	Introduction to geotechnical Engineering	3
AESM2901-16	Geoscience and Engineering Fieldwork	10

Article 11 – The Geoscience and Remote Sensing track

The Geoscience and Remote Sensing track has one specialisation:
- Geoscience and Remote Sensing

All students must complete the compulsory Ethics course of 4 credits:
CIE4510 Climate change: Science & Ethics

Common compulsory block Geoscience and Remote Sensing
All students opting for the track Geoscience and Remote Sensing must complete the following subjects adding up to 29 credits:

code	subject	ECs
CIE4601	Physics of the Earth and Atmosphere	5
CIE4603-16	Geo-signal Analysis	6
CIE4604	Simulation and Visualization	5
CIE4606	Geodesy and Remote Sensing	5
CIE4611	Geo-measurement Processing	5
CIE4615	GRS Fieldwork	3

Additional block Geoscience and Remote Sensing
Students are required to complete a selection of the following subjects adding up to a total of 56 credits.

Choose at least 12 credits out of:

code	subject	ECs
CIE4522-15	GPS for Civil Engineering and Geosciences	4
CIE4602	Ice, Snow and Climate Change: Observation and Modelling	4
CIE4605	Atmospheric Science	4
CIE4607	Oceans, Sea-level and Bathymetry	4
CIE4608	Atmospheric Observation	4
CIE4609	Geodesy and Natural Hazards	4
CIE4610	Mass Transport in the Earth's System	4
CIE4614	Land Surveying and Civil Infrastructure	4

[27] Students who passed CTB3390 , AESB3340 or an equivalent course cannot take this course.
[28] Students who passed CTB2310 (Soil Mechanics) or an equivalent course cannot take this course.

and choose adding up to a total of 56 credits out of:

CIE4612	Research Seminar Geoscience and Remote Sensing II	1
CIE5601	Advanced Topics in Geoscience and Remote Sensing	3
CIE5602	Research Seminar Geoscience and Remote Sensing I	1
CIE5603	Advanced project on GRS	3

any Master's degree course subject Civil Engineering or Applied Earth Sciences

Article 12 – Environmental Engineering

The Environmental Engineering track has two specialisations:
- Environmental Technology
- Environmental Science

The compulsory programme for each specialisation consists of a common compulsory Environmental engineering block of 21 credits and 4 credits compulsory Ethics course. Depending on your specialisation profile you have an additional block of 36 credits (Environmental Technology) or 34 credits (Environmental Science).

Common compulsory block Environmental Engineering

All students opting for the track Environmental Engineering must complete the following subjects adding up to 21 credits:

code	subject	ECs
CIE4701	Transport processes in Environmental Science and Engineering	4
CIE4495-13	Fundamentals of Water Treatment	4
CIE4440	Hydrological Processes and Measurements	4
CIE4702	Integrated Project: Leapfrog Environmental Degradation	4
CIE4365-16	Modelling Coupled Processes for Engineering Applications	5

All students must complete the compulsory Ethics course of 4 credits:

CIE4510	Climate change: Science & Ethics	4

In addition to the presented programme students must meet the following requirements:
- Students who have not done Introduction to water Treatment in the Bachelor's phase are strongly advised to take CIE3365 Introduction to Water Treatment as an elective subject.

Additional block Environmental Technology

Students who have opted for the specialisation Environmental Technology must complete the following subjects adding up to 36 credits:

code	subject	ECs
CIE4703	Water Treatment	6
CIE4704	Chemical Processes in Water Technology	5
CIE4705	Environmental Biotechnology & Microbiology	6
CIE4710	Materials separation in Waste Processing	5
CIE5421	Water and Health	4
CIE5704	Water Treatment Research	5
CIE5702	Conceptual Process design	5

Additional block Environmental Science

Students who have opted for the specialisation Environmental Science must complete the following subjects adding up to 34 credits:

code	subject	ECs
CIE5450	Hydrology of Catchments, Rivers and Deltas	4
CIE4707	Air Quality	5
CIE4706	Introduction into Meteorology	5
CIE4709	Remote Sensing for Environmental Monitoring	5
CIE4708	Water in the Atmosphere	5
CIE5703	Urban Climate & Hydrology	5
CIE5701	From Field Observations to Modelling	5

Environmental Engineering electives

All subjects listed above and not part of the chosen specialisation can be chosen as electives. In addition other electives can be chosen as specified in article 3, part 1c. Students who have opted for the specialisation Environmental Technology can choose

electives with a minimum of 19 credits. Students who have opted for the specialisation Environmental Science can choose electives with a minimum of 21 credits.

Section 2 – Annotations and Honours Programme

Article 13A – The Technology in Sustainable Development annotation

1. The examination programme for students who have opted for the annotation Technology in Sustainable Development must at least include the following:
   a. a sustainable development colloquium of 5 credits: WM0939TU, Engineering for Sustainable Development,
   b. subjects within or outside the realm of the degree course adding up to a total of at least 10 credits to be selected from the two clusters:
      - Design, Analysis and Tools
      - Organisation and Society.
      At least 3 credits should derive from each of the clusters.
      Further information on the subjects to be selected and on the clusters is available from the referent, from the manual and from the website of Delft University of Technology.
   c. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 subsection 1 clause d. The Master Thesis Project must partly focus on the topic of sustainable development. The referent will test the hypothesis of the project and the way in which it has been tackled against the extent to which sustainable development issues have been integrated into the project.

2. Students who complete the annotation successfully, receive an annotation Technology in Sustainable Development with their degree certificate.

Article 13B – Entrepreneurship annotation

1. The examination programme for students who have opted for the annotation Entrepreneurship must at least include the following:
   a. electives related to entrepreneurship adding up to a total of 15 credits, 10 of which are extracurricular,
   b. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 subsection 1 clause d, partly focusing on the topic of entrepreneurship.

2. The examination programme for the Entrepreneurship annotation needs the prior approval by a coordinator of Delft Centre for Entrepreneurship and the board of examiners.

3. Students who complete the annotation successfully, receive an annotation Entrepreneurship with their degree certificate.

Article 13C – The Urban Planning and Engineering annotation ("Stadsingenieur")

1. The examination programme for students who have opted for the annotation Urban Planning and Engineering must at least include the following:
   a. 20 credits as mentioned in Article 3 subsection 1 clause c, relating to one or more of the following fields:
      - Urban and Regional Planning
      - Infrastructure Planning
      - Real Estate
      - Site Development
      - Land Clearing
      - Urban Civil Engineering.
   b. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 subsection 1 clause d, partly focusing on the topic of at least one of the above mentioned fields.
      The annotation can be obtained within the examination programme (120 credits) if the student uses the electives and/or the possibilities mentioned in Article 3 subsection 1 clause c, otherwise these electives and/or possibilities will be extracurricular.

2. The examination programme for the Urban Planning and Engineering annotation needs the prior approval by the board of examiners, who will seek the programme director's advice.

3. Students who complete the annotation successfully, receive an annotation Urban Planning and Engineering with their degree certificate.

Article 13D – The Infrastructure Planning and Environmental Engineering annotation ("Infrastructuur en milieu")

1. The examination programme for students who have opted for the annotation Infrastructure Planning and Environmental Engineering must at least include the following:
   a. 20 credits as mentioned in Article 3 subsection 1 clause c, relating to one or more of the following fields:
      - Infrastructure Planning
      - Regional Planning
      - Environmental Engineering
      - Cost Benefit Analysis
      - Risk Analysis
      - Financial Engineering
      - Policy and Decision Making
      - Project and Process Management.
   b. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 subsection 1 clause d, partly focusing on the topic of at least one of the above mentioned fields.
      The annotation can be obtained within the examination programme (120 credits) if the student uses the electives and/or the possibilities mentioned in Article 3 subsection 1 clause c, otherwise these electives and/or possibilities will be extracurricular.

2. The examination programme for the Infrastructure Planning and Environmental Engineering annotation needs the prior approval by the board of examiners, who will seek the programme director's advice.

3. Students who complete the annotation successfully, receive an annotation Infrastructure Planning and Environmental Engineering with their degree certificate.

Article 13E – The Integral Design Management annotation

1. The examination programme for students who have opted for the annotation Integral Design Management must include the following:
   a. subjects within or outside the compulsory or elective subjects of the chosen track and/or specialisation adding up to a total of 8 credits (4 credits if CTB3380 has been completed in the Bachelor's phase):

code	subject	ECs
CIE3380	Infrastructure Management	4
CIE4480	Integral Systems Design	4

   b. subjects from the list below within or outside the compulsory or elective subjects of the chosen track and/or specialisation adding up to a total of at least 6 credits (10 credits if CTB3380 has been completed in the Bachelor's phase):

code	subject	ECs
CIE4120[29]	Information Systems for the Construction Industry	4
CIE4130	Probabilistic Design and Risk Management	4
CME1210-14	Infrastructure Asset Management	7
CME2300	Financial Engineering	4
SPM8000	Project Management	7
AR8002TU	Legal and Governance	7
IN4170	Databases and Data Mining	6
IN4325	Information Retrieval	5
WI4051TU	Introduction to Operation Research	6
WI4138	Decision Theory/Expert Judgement	6

   c. a Multidisciplinary Project (CIE4061-09) carrying 10 credits as mentioned in Article 3 subsection 1 clause c. The Multidisciplinary Project must focus on the topic of integral design management. The coordinator will test the hypothesis of the project and the way in which it has been tackled against the extent to which integral design management issues have been integrated into the project.
      Non CME-students may replace CIE4061-09 by courses CME 1200 Collaborative Design (7 EC) and CME 2210 Open Design (3 EC).

   d. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 subsection 1 clause d. The Master Thesis Project must partly focus on the topic of integral design management. The coordinator will test the hypothesis of the project and the way in which it has been tackled against the extent to which integral design management issues have been integrated into the project.

[29] as of 1 September 2015

2. Students who complete the annotation successfully, receive an annotation Integral Design Management with their degree certificate.

Article 13F – The Rail annotation

1. The examination programme for students who have opted for the annotation Rail must include the following:
   a. subjects within or outside the compulsory or elective subjects of the chosen track and/or specialisation adding up to a total of 8 credits:

code	Subject	EC's
CE5603 (NUS)	Engineering Economics and Project Evaluation	6
CE5710 (NUS)	Design of Floating Structures	6

   b. subjects from the list below within or outside the compulsory or elective subjects of the chosen track and/or specialisation adding up to a total of at least 14 credits:

code	subject	ECs
CIE4811-09	Planning and Operations of Public Transport Systems	6
CIE4870	Structural Design of Railway Track	4
CIE4873	Wheel-Rail Interface	4
CIE4871	Design and Maintenance of Railway Vehicles	4
CIE5803-09	Railway Traffic Management	4
CIE5811	Transport Safety	4
CIE5875	Railway Asset Management	4
CIE5874	Mechanical and Material Engineering in Railway Asset Management	4

2. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 subsection 1 clause d, focusing on the topic of railway operations and/or railway engineering. The annotation coordinators will test the hypothesis of the project and the way in which it has been tackled against the extent to which railway operations and/or railway engineering has been integrated into the project.

3. Students who complete the annotation successfully, receive an annotation Rail with their degree certificate.

Article 13G – Dynamics of Structures

1. The examination programme for students who have opted for the annotation Dynamics of Structures must at least include the following:

   a. The following subjects adding up to 22 credits:

code	course	ECs
CIE4140	Dynamics of Structures	4
CIE4260	Measurement and Analysis of Vibrations	4
CIE5145	Random Vibrations	3
CIE5260	Structural Response to Earthquakes	4
CIE5340	Soil Dynamics	3
OE44055	Load Identification and Monitoring of Structures	4

   b. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 subsection 1 clause d, partially focusing on the topic of Dynamics of Structures.

2. The annotation can be partly obtained within the examination programme (120 credits) if the student uses track-linked subjects or the electives and/or the possibilities mentioned in Article 3 subsection 1 clause c, otherwise these electives and/or possibilities will be extracurricular.

3. The examination programme for the Dynamics of Structures annotation needs the prior approval by a coordinator of Delft Centre for Entrepreneurship and the board of examiners.

4. Students who complete the annotation successfully, receive an annotation Dynamics of Structures with their degree certificate.

Article 14 – Honours Programme Master

1. Motivated students who have finished their Bachelor's degree course with a weighed averaged mark of 7.5 or higher, and students who have excelled during the first semester (no fails and a weighed average of 7.5 or higher) are eligible for a special individual programme of 20 credits on top of the Master's degree course: the Honours Programme Master.
2. The content of the Honours Programme Master should be thematically consistent. The subject UD2010 , Critical Reflection on Technology, 5 credits, is compulsory to the Honours Programme Master.
3. Students who fulfil, or will fulfil, the requirements laid down in subsection 1, and are interested in the Honours Programme Master can send their application to the programme coordinator together with an essay in English, containing their motivation and a proposal for the programme. The programme has to be approved by a scientific staff member and the programme coordinator.
4. The Honours Programme Master has to be completed during the course of the student's Master's programme. None of the results may be lower than 6.0.
5. The various parts of the programme will be assessed by the respective examiner(s). The fulfilment of all criteria to the Honours Programme Master will be assessed by the board of examiners.
6. Students who have successfully completed the Honours Programme Master will receive a special certificate from the university with their degree certificate.

Section 3 – Transitional programme

Article 15 – Transitional programme for students with a Dutch higher vocational institute Bachelor degree ("HBO")

1. Students who want to be admitted to the Master's degree course on the basis of a relevant Dutch higher vocational institute Bachelor degree have to complete a transitional programme **first** consisting of a common deficiency block of 26 to 29 credits and an additional track-linked block of 12 to 16 credits.

   Students participating in the transitional programme as part of their relevant higher vocational education, have to complete the common deficiency block within their higher vocational education examination programme. Furthermore they have to complete the additional track-linked block **before** they will be admitted to the Master's degree course.

2. Common deficiency block

code	subject	ECs
CTB1210	Dynamics and Modelling	5
CTB2400	Numerical Methods for differential Equations	3
CTB2001HBO-16	Computer Programming HBO	3
WI1708TH1	Analysis 1	3
WI1708TH2	Analysis 2	3
WI1708TH3	Analysis 3	3
WI1808TH1	Linear Algebra (part 1)	3 (not for GRS)
WI1909TH	Differential Equations	3
WI2031TH	Kansrekening en statistiek voor hbo-instromers	3

3. Additional track-linked block
   Furthermore the following subjects have to be completed within the transitional programme:

   In case the track Structural Engineering has been chosen:

code	subject	ECs (total 29 + 15)
CTB2210	Structural Mechanics 3	5
CTB2300	Dynamics of Systems	3
CTB3330	Structural Mechanics 4	4
CT1730HBO	Introduction to Geotechnical Engineering	3

   In case the track Building Engineering has been chosen:

code	subject		ECs (total 29 + 15)
CTB2210	Structural Mechanics 3		5
CTB2300	Dynamics of Systems		3
CTB3340-15	Building Structures 1		4
bestaande uit:			
CTB3340-15 D1	Constructies van gebouwen 1/ Building Structures 1, deel 1	2	
CTB3340-15 D2	Constructies van gebouwen 1/ Building Structures 1, deel 2	2	
CT1730HBO	Introduction to Geotechnical Engineering		3

In case the track Hydraulic Engineering has been chosen:

code	subject	ECs (total 29+ 16)
CTB2110	Fluid Mechanics	5
CTB2210	Structural Mechanics 3	5
CTB2300	Dynamics of Systems	3
CT1730HBO	Introduction to Geotechnical Engineering	3

In case the track Water Management has been chosen:

code	subject	ECs (total 29+ 14)
CTB2110	Fluid Mechanics	5
CTB2420-14	Hydrology	5
CTB3365 -16	Introduction to Water Treatment	4

In case the track Transport and Planning has been chosen:

code	subject	ECs (total 29 + 15)
CTB3370	Geometrical Design of Roads and Railways	4
CTB3380-14	Infrastructure Management	4
CTB3420	Integral Design of Infrastructure	4
CT1730HBO	Introduction to Geotechnical Engineering	3

In case the track Geo-Engineering has been chosen:

code	subject	ECs (total 29 + 12)
CTB2210	Structural Mechanics 3	5
CTB3425	Monitoring and Stability of Dikes and Embankments	4
CT1730HBO	Introduction to Geotechnical Engineering	3

In case the track Geoscience and Remote Sensing has been chosen:

code	subject	ECs (total 26 + 15)
CTB2300	Dynamics of Systems	3
CTB3310	Surveying and Mapping	4
TA2601	Practical Matlab	2
WI1807TH1	Linear Algebra 1	3
WI1807TH2	Linear Algebra 2	3

In case the track Environmental Engineering has been chosen:

code	subject	ECs (total 29 + 14)
CTB2110	Fluid Mechanics	5
CTB2420	Hydrology	5
CTB3365-16	Introduction to Water Treatment	4

Section 4 – Deviate from examination programme

Article 16 – The free study programme

1. Students are free to compile examination programmes that are rounded off with a final exam. Such a programme needs **prior approval** by the board of examiners and it must consist entirely or mainly of subjects given in conjunction with the degree course but it can be complemented with subjects provided by or given in other courses.

2. The preliminary approval referred to in subsection 1 must be presented to the board of examiners by the student in the form of a justified request.

Article 17 – Deviate from the examination programme

The board of examiners may allow students to deviate from the examination programme.

Section 5 – Examinations and practicals

Article 18 – Practicals

1. The course teaching takes the form of lectures and/or practicals.

2. Practicals must be completed before students participate in the examination unless otherwise is indicated in the study guide pertaining to that particular subject.

Article 19 – The types of examinations

The examinations linked to the different subjects are to be completed in the way laid down in the study guide pertaining to the subject in question.

Article 20 – The frequencies, times and sequences of the exams

1. Written and oral examinations are to be completed at the end of the teaching period in which the subject was taught.

2. The resit periods for any of the written exams referred to in subsection 1 are at the end of the next teaching period. For subjects taught in the fourth teaching period the resit period is in August.

3. Practicals may be completed in the way laid down in the relevant timetables.

Section 6 – Access to Master Thesis Project

Article 21 – Access to the Master Thesis Project

1. Students may embark on the Final Thesis only when they have no more than 15 credits of uncompleted subjects of the Master's degree course from all their other subjects of the course.

2. Students are only allowed to present their Final Thesis if they have successfully completed all other obligations.

Section 7 – Transition Rulings

Article 22 – The transition ruling 1 September 2009 and before

Transition Rulings of 1 September 2009 and before one can find in the previous Implementation Regulations.

Article 23 – For students of the former Sanitary Engineering specialisation

1. Transition ruling for CIE 4485

If the student follows the old Sanitary Engineering specialisation and did not pass any aspect of CIE4485 in the study year 2015/2016, he/she should follow the wastewater treatment part in course CIE4703 (week 2.1, 2.5-2.7) and takes the CIE4485 at the same moment of the partial exam CIE4703 wastewater treatment. The student will get an additional assignment instead (equal to 2 ECTS) of the practicals and Biowin assignment of CIE 4485.
If the student already passed the Biowin and/or the Practicals, but failed the exam, he/she could do a resit of the old CIE4485 exam at same time as the partial exam wastewater treatment (separate room). The gradings of the practicals and/or Biowin course will be copied from the year before. If one of these two were not passed before, an additional assignment (1 ECTS) will be given instead of these two practical modules.

2. Transition ruling for CIE 4475

If the student follows the old Sanitary Engineering specialisation and did not pass any aspect of CIE4475 in the study year 2015/2016, he/she should follow the wastewater treatment part in course CIE4703 (week 2.1-2.4) and takes the CIE4475 at the same moment of the partial exam CIE4703 wastewater treatment. The student will get an additional assignment instead (equal to 2 ECTS) of the practicals and Literature review of CIE 4475.

If the student already passed the Literature review and/or the Practicals, but failed the exam, he/she could do a resit of the old CIE4475 exam at same time as the partial exam drinking water treatment (separate room). The gradings of the practicals and/or Literature review will be copied from the year before. If one of these two were not passed before, an additional assignment (1 ECTS) will be given instead of these two practical modules.

3. Students for whom this article is intended are required to contact the responsible examiner, so the examiner can apply this transitional rule to their individual situation.