

IMPLEMENTATION REGULATIONS

2014-2015

**INTERFACULTY
MASTER OF SCIENCE
TRANSPORT, INFRASTRUCTURE AND LOGISTICS**

DELFT UNIVERSITY OF TECHNOLOGY

LIST OF CONTENTS

Chapter 1 – Compiling the study programme	3
Article 1 – The study load	3
Article 2 – The composition	3
Article 3 – Fundamentals	3
Article 4 – Specialisations	3
Article 5 – Electives	4
Article 6 – Seminars	5
Article 7 – Projects	6
Article 8 – Graduation work	6
Article 9 – Elective projects	7
Article 10 – The Technology in Sustainable Development annotation	7
Article 11 – The Entrepreneurship annotation	8
Article 12 – The Infrastructure and Environment annotation	8
Article 13 – The Integral Design and Management annotation	9
Article 14 – The Rail annotation	9
Article 15 – The Honours Programme Master	10
Chapter 2 – Transitional and other deficiency programmes	11
Article 16 – Transitional programme for students with a Dutch higher vocational bachelor's degree	11
Article 17 – Transitional minor programme for students with a Dutch university bachelor's degree	11
Article 18 – Convergence programme for students with a Dutch university bachelor's degree	11
Chapter 3 – Deviate from examination programme	12
Article 19 – The free study programme	12
Article 20 – Deviate from the examination programme	12
Chapter 4 – Examinations and practicals	12
Article 21 – Practicals	12
Article 22 – The types of examinations	12
Article 23 – The frequencies, times and sequences of the exams	12
Chapter 5 – Transitional rules	12
Article 24 – Transitional rules as of 1 September 2014	12

Chapter 1 – Compiling the study programme

Article 1 – The study load

The study load for the master's degree programme is 120 credits, excluding subjects or equivalent subjects students completed as part of their bachelor's degree programme.

Article 2 – The composition

1. The examination programme of 120 credits comprises the following components:
Courses, 80 credits
 - a. Fundamentals, 27 credits as laid down in Article 3
 - b. Specialisations, 26-27 credits as laid down in Article 4
 - c. Electives, 26-27 credits as laid down in Article 5Projects and seminars, 40 credits
 - d. Seminars, 3 credits as laid down in Article 6
 - e. Interdisciplinary design project, 7 credits as laid down in Article 7
 - f. Interdisciplinary graduation work, 30 credits as laid down in Article 8
2. The student may opt for the following annotation programmes of 15 credits:
 - Technology in Sustainable Development, as laid down in Article 10
 - Entrepreneurship, as laid down in Article 11
 - Infrastructure and Environment, as laid down in Article 12
 - Integral Design and Management, as laid down in article 13
 - Rail, as laid down in article 14Apart from the programmes of 15 credits, there are additional requirements. Parts of the annotation programme may become extracurricular.
3. The student may be eligible for a special programme of 20 credits on top of the master's degree programme:
 - Honours Programme Master, an individual programme as laid down in Article 15
 - Honours Programme Master Research, as laid down in Article 15, paragraph 7
 - Honours Programme Master Infrastructures and Environment, as laid down in Article 15, paragraph 8
4. Any changes made to the examination programme should be presented to the board of examiners.

Article 3 – Fundamentals

The student is obliged to complete the following basic components, the so-called fundamentals, amounting to 27 credits in total:

<u>code</u>	<u>subject</u>	<u>credits</u>
CIE4801	transportation and spatial modelling	6
SPM4612	statistical methods for behavioural analysis	6
TIL4030-14	interdisciplinary fundamentals	9
WB3420-11	introduction transport and logistic engineering	6

Article 4 – Specialisations

From the four subject specialisations given below the student is required to select one, amounting to 26 or 27 credits in total:

<u>Specialisation P – Policy: infrastructure, planning and environment, 27 credits</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>
AR0190	urban sustainability	2
CIE4760	infrastructure projects: assessment and planning	6
CIE5750	transport and spatial planning for urbanized regions	4
CIE5811*	transport safety	4
SPM4631	transport policy	6
SPM5610	planning and design of multi-modal infrastructure networks	5

* available from 2015-2016

<u>Specialisation D – Design: transport systems and networks, 27 credits</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>
AE4443	airline operations	5
CIE4811-09	design and control of public transport systems	6
CIE5802-09	advanced transportation modelling	4
CIE5803-09	railway traffic management	4
SPM5610	planning and design of multi-modal infrastructure networks	5
WI4062TU	transport, routing and scheduling	3

<u>Specialisation O – Operations: traffic, technology and control, 26 credits</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>
CIE4821-09	traffic flow theory and simulation	6
CIE5804-09	innovations in dynamic traffic management	4
ME1406	control of intelligent transport infrastructures	3
CIE5805	intelligent vehicles	4
SPM9325	simulation master class	4
WB3417-04	discrete systems: modelling, prototyping, simulation & control	5

<u>Specialisation E – Engineering: transport, logistics and supply chains, 26 credits</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>
CIE4840	freight transportation systems: analysis and modelling	4
ME1405	automation of transport systems	3
ME1406	control of intelligent transport infrastructures	3
SPM4621	supply chain analysis and engineering	6
SPM5620	design and control of multi-modal logistic chains	4
WB3419-03	characterisation & handling of bulk solid materials	6

Article 5 – Electives

1. The credits awarded for the elective subjects chosen by the student have to add up to a total of 26 or 27 credits.
2. The amount of credits mentioned in paragraph 1 depends on the size of the chosen specialisation as indicated in Article 4: the total amount of credits of the fundamentals as indicated in Article 3, the specialisations as indicated in Article 4 and electives should add up to a total of 80 credits.
3. The student is required to select at least one subject, not already taken as part of the chosen specialisation as stipulated in Article 4, from each of the three elective lists as given below:

<u>Electives T&P – Transport and Planning, at least 1 subject</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>
CIE4760	infrastructure projects: assessment and planning	6
CIE4811-09	design and control 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
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	4
CIE5810-09	traffic safety	4
CIE5811**	transport safety	4

* cannot be chosen if already taken in BSc-minor CT-MI-127 as CT5730, CIE5730MI or CT3365

** available from 2015-2016

<u>Electives T&L – Transport and Logistics, at least 1 subject</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>
SPM4416	strategic management of large engineering projects	6
SPM4423	legal aspects of MAS design	5
SPM4621	supply chain analysis and engineering	6
SPM4631	transport policy	6
SPM5610	planning and design of multi-modal infrastructure networks	5

SPM5620	design and control of multi-modal logistic chains	4
SPM9155	advanced systems dynamics	4
SPM9325	simulation master class	4

Electives TEL – Transportation Engineering, at least 1 subject

<u>code</u>	<u>subject</u>	<u>credits</u>
ME1403-13	advanced operations management	6
ME1405	automation of transport systems	3
ME1406	control of intelligent transport infrastructures	3
ME1410-13	quantitative methods for logistics	6
ME1430	advanced design of baggage handling systems	3
WB3416-03	design with the finite element method	3
WB3417-04	discrete systems: modelling, prototyping, simulation & control	5
WB3419-03	characterisation & handling of bulk solid materials	6
WB3422-11	design of transport equipment	6
WB3423-04	the delft systems approach	3

4. The student is required to select at least one external subject, not already taken as part of the chosen specialisation as stipulated in Article 4, from the external elective subjects as given below:

Electives C&O – Control & Operations

<u>code</u>	<u>subject</u>	<u>credits</u>
AE4321	air traffic management	3
AE4441	operations optimisation	6
AE4443	airline operations	5
AE4446	airport operations	4
AE4451	network and fleet planning	3
AE4454	life cycle analysis and production	6

Electives U – Urbanism

<u>code</u>	<u>subject</u>	<u>credits</u>
AR0027	smart infrastructure and mobility	6
AR0190	urban sustainability	2
AR0551	people, movement and public space	3

Electives TIL – Other TIL fields

<u>code</u>	<u>subject</u>	<u>credits</u>
CIE4330	ports and waterways 1	4
CIE5306	ports and waterways 2	4
MT313	shipping management	3
WI4062TU	transport, routing and scheduling	3
WM0320TU	ethics and engineering	3

5. If the subjects selected according to paragraph 3 and 4 add up to an amount of credits that is smaller than the amount of credits stipulated in paragraph 2, the student is required to select additional, so-called free elective subjects, within the restrictions given below.
- As free elective subjects the student may choose:
 - elective projects as mentioned in Article 9, paragraph 1
 - all subjects offered at master level at Delft University of Technology
 - all subjects offered at master level at another Dutch university.
 - As free elective subjects the student may not choose:
 - all subjects that have significant overlap with any other subject in the examination programme
 - language courses. They may, however, be chosen as extra courses that will be considered extracurricular.
 - For free elective subjects the student needs prior approval from the programme coordinator. If parties fail to reach agreement, the board of examiners decides.

Article 6 – Seminars

The student is required to participate in and organise seminars. Thus he is expected to complete:

<u>code</u>	<u>subject</u>	<u>credits</u>
TIL4010-11	TIL seminars	3

Article 7 – Projects

1. The student is expected to complete an interdisciplinary design project:

<u>code</u>	<u>subject</u>	<u>credits</u>
TIL5050-12	interdisciplinary design project	7

2. The student is allowed to start the project mentioned in paragraph 1, once:
 - a. a total of at least 60 credits has been gained;
 - b. the obligations stipulated in Article 3, the so-called fundamentals, have been met;
 - c. he has completed at least one subject from each of the four elective lists mentioned in Article 5, paragraph 4. Please note that in this particular case, unlike Article 5, paragraph 3, the chosen subjects may be part of the chosen specialisation as stipulated in Article 4.
3. If the student does not meet at the most one of the criteria as indicated in paragraph 2, the course coordinator may give exceptional access to the project mentioned in paragraph 1. If parties fail to reach agreement, the board of examiners decides.
4. Further stipulations relating to the project are given in the Rules and Guidelines laid down by the board of examiners.

Article 8 – Graduation work

1. The student is expected to complete graduation work:

<u>code</u>	<u>subject</u>	<u>credits</u>
TIL5060	thesis	30

2. The content of the graduation work has a relationship to the fields of at least two of the faculties involved in the programme: the faculty of Civil Engineering and Geosciences, the faculty of Technology, Policy and Management and the faculty of Mechanical, Maritime and Materials Engineering. This is reflected in the composition of the assessment committee for the graduation project.
3. The assessment committee will consist of at least three examiners. The members of the committee will originate in any event from two different of the above mentioned faculties.
4. The graduation work consists of a graduation project, a thesis report and a graduation presentation. The thesis report includes a summary.
5. The project is subject to a strict planning and timetable; specific dates and deadlines need to be set for the kick off, mid term and green light evaluations as well as for the final assessment and presentation of the project. The planning and the project process will be monitored by the graduation coordinator.
6. Before embarking on graduation work the student must compile his entire examination programme, then present it to the board of examiners, together with the assessment committee's composition.
7. The student is allowed to start the graduation work mentioned in paragraph 1, once all the obligations mentioned in Articles 3, 4, 5 and 7 have been met, under the understanding that of the electives mentioned in Article 5, subjects with a total of not more than 6 credits may not have been completed yet.
8. If the student does not meet the criteria as indicated in paragraph 6, the chair of the assessment committee as indicated in paragraph 3 may give exceptional access to the project mentioned in paragraph 1. If parties fail to reach agreement, the board of examiners decides.
9. Any changes made to the approved assessment committee should be presented to the board of examiners.
10. Further stipulations regarding the graduation work are included in the Rules and Guidelines laid down by the board of examiners.

Article 9 – Elective projects

1. The student is expected to complete projects and seminars as mentioned in the Articles 6, 7 and 8. Apart from these obligatory subjects, there are elective projects. The elective projects are:

<u>code</u>	<u>subject</u>	<u>credits</u>
TIL4020-11	interdisciplinary research project	7
CIE4040-09	internship	10
CIE4061-09	multidisciplinary project	10

2. The student is allowed to start an elective project as mentioned in paragraph 1, once the obligations stipulated in Article 3, the so-called fundamentals, have been met.
3. If the student does not meet the criterion indicated in paragraph 2, the course coordinator may give exceptional access to a project as mentioned in paragraph 1. If parties fail to reach agreement, the board of examiners decides.
4. An internship consists of a project defined in consultation with a scientific staff member of the university before it is carried out at an institution outside the university.
5. Further stipulations pertaining to the internship are included in the Rules and Guidelines laid down by the board of examiners.

Article 10 – 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:

<u>code</u>	<u>subject</u>	<u>credits</u>
WM0939TU	engineering for sustainable development	5

- b. Subjects within or outside the realm of the degree programme 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 both clusters.
Further information on the subjects to be selected and on the clusters is available from the programme coordinator, from the manual and from website of Delft University of Technology.
 - c. Graduation work carrying 30 credits in line with what is stipulated in Article 8. The graduation work must focus on the topic of sustainable development. The Sustainable Development (SD) referent of the degree programme will test the hypothesis of the graduation 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. For obtaining the annotation within the examination programme of 120 credits the student may use the free elective space, mentioned in Article 5, paragraph 5, to accommodate the annotation subjects mentioned in paragraph 1 under a and b. However, if the amount of credits in the free elective space, mentioned in Article 5, paragraph 5, is not sufficient to accommodate the annotation subjects mentioned in paragraph 1 under a and b that are not already part of the components of the degree programme mentioned in the Articles 3 and 4 and in Article 5, paragraphs 3 and 4, the surplus of credits of the annotation subjects will be extracurricular.
 3. The examination programme for the Technology in Sustainable Development annotation needs prior approval by the Sustainable Development (SD) referent of the degree programme and the board of examiners.
 4. Students who complete the annotation successfully, receive an annotation Technology in Sustainable Development with their degree certificate.

Article 11 – The Entrepreneurship annotation

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

a. Participation in the Entrepreneurship Annotation Week:

<u>code</u>	<u>subject</u>	<u>credits</u>
WM4001TU	entrepreneurship annotation week	2

b. Subjects related to entrepreneurship adding up to at least 13 credits.

c. Graduation work carrying 30 credits in line with what is stipulated in Article 8, partly focusing on the topic of entrepreneurship.

2. For obtaining the annotation within the examination programme of 120 credits the student may use the free elective space, mentioned in Article 5, paragraph 5, to accommodate the annotation subjects mentioned in paragraph 1 under a and b. However, if the amount of credits in the free elective space, mentioned in Article 5, paragraph 5, is not sufficient to accommodate the annotation subjects mentioned in paragraph 1 under a and b that are not already part of the components of the degree programme mentioned in the Articles 3 and 4 and in Article 5, paragraphs 3 and 4, the surplus of credits of the annotation subjects will be extracurricular.

3. The examination programme for the Entrepreneurship annotation needs 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 Entrepreneurship with their degree certificate.

Article 12 – The Infrastructure and Environment annotation

1. The examination programme for students who have opted for the annotation Infrastructure and Environment must at least include the following:

a. The Infrastructure and Environment annotation course:

<u>code</u>	<u>subject</u>	<u>credits</u>
SPM9160	infrastructure and environmental governance	3

b. Subjects adding up to at least 12 credits 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

c. A group project carrying at least 7 credits as mentioned in Article 7 or Article 9. Internships are excluded. The project must focus on at least one of the under b mentioned fields. The project concerns a current realistic issue from the sector and is supervised by the TU Delft as well as by a supervisor from the Ministry of Infrastructure and the Environment.

d. Graduation work carrying 30 credits in line with what is stipulated in Article 8, partly focusing on the topic of at least one of the under b mentioned fields.

2. For obtaining the annotation within the examination programme of 120 credits the student may use the free elective space, mentioned in Article 5, paragraph 5, to accommodate the annotation subjects mentioned in paragraph 1 under a and b. However, if the amount of credits in the free elective space, mentioned in Article 5, paragraph 5, is not sufficient to accommodate the annotation subjects mentioned in paragraph 1 under a and b that are not already part of the components of the degree programme mentioned in the Articles 3 and 4 and in Article 5, paragraphs 3 and 4, the surplus of credits of the annotation subjects will be extracurricular.

3. The examination programme for the Infrastructure and Environment annotation needs prior approval by the annotation coordinator and the board of examiners.

4. Students who complete the annotation successfully, receive an annotation Infrastructure and Environment with their degree certificate.

Article 13 – The Integral Design and Management annotation

1. The examination programme for students who have opted for the annotation Integral Design and Management must at least include the following:

a. Subjects adding up to a total of 8 credits:

<u>code</u>	<u>subject</u>	<u>credits</u>
CIE3380*	infrastructure management	4
CIE4480	integral design and management	4

* *not if CTB3380 has been completed as part of bachelor's degree programme. In that case the student has to complete at least 11 credits from the subjects mentioned under b.*

b. Subjects from the list below adding up to a total of at least 7 credits:

<u>code</u>	<u>subject</u>	<u>credits</u>
4413UEINFY	urban environments and infrastructures	6
AR0028	design of infrastructural artefacts	6
CIE4120*	information systems for the construction industry	4
CIE4130	probabilistic design and risk management	4
CIE4170	construction technology of civil engineering structures	4
CIE4760	infrastructure projects: assessment and planning	6
CIE5981	forms of collaboration in civil engineering	4
CME2300	financial engineering	4
EPA1322	continuous systems modelling	5
EPA1412**	project management	5
SPM4416**	strategic management of large engineering projects	6
SPM8000**	project management	7

* *available from 2015-2016*

** *EPA1412, SPM4416 and SPM8000 cannot be chosen in any combination*

- c. A group project carrying at least 7 credits as mentioned in Article 7 or Article 9. Internships are excluded. The project must focus on the topic of integral design management. The annotation 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.
- d. Graduation work carrying 30 credits in line with what is stipulated in Article 8, partly focusing on the topic of integral design management. The annotation 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.

2. For obtaining the annotation within the examination programme of 120 credits the student may use the free elective space, mentioned in Article 5, paragraph 5, to accommodate the annotation subjects mentioned in paragraph 1 under a and b. However, if the amount of credits in the free elective space, mentioned in Article 5, paragraph 5, is not sufficient to accommodate the annotation subjects mentioned in paragraph 1 under a and b that are not already part of the components of the degree programme mentioned in the Articles 3 and 4 and in Article 5, paragraphs 3 and 4, the surplus of credits of the annotation subjects will be extracurricular.

3. The examination programme for the Integral Design and Management annotation needs prior approval by the board of examiners.

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

Article 14 – The Rail annotation

1. From the academic year 2015-2016 an annotation Rail will be available.

2. The examination programme for the Rail annotation will be published in the Implementation Regulations 2015-2016.

3. The examination programme for the Rail annotation will include the following subjects (or their successors):

<u>code</u>	<u>subject</u>	<u>credits</u>
CIE4811-09	design and control of public transport systems	6
CIE4870	structural design of railway track	4
CIE5803-09	railway traffic management	4

Article 15 – The Honours Programme Master

1. Motivated students who have finished their bachelor's degree programme 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 programme: the Honours Programme Master.

2. The Honours Programme Master has to be completed during the student's master's degree programme.

3. The content of the Honours Programme Master should be thematically consistent.

4. One subject is compulsory for all Delft University of Technology Honours Programme Master students:

<u>code</u>	<u>subject</u>	<u>credits</u>
WM0355HT	critical reflection on technology	5

The study goal is to develop competence in forming an independent, well-argued position with regard to ethical and methodological problems that concern the professional practice of engineers.

5. One subject is compulsory specific for the degree programme's Honours Programme Master students:

<u>code</u>	<u>subject</u>	<u>credits</u>
TIL4020-11	interdisciplinary research project	7

6. The student chooses, taking paragraph 3 into account, the remaining subjects, amounting to 8 credits in total, unless he participates in the Honours Programme Master Research as specified in paragraph 7 or the Honours Programme Master Infrastructures and Environment as specified in paragraph 8.

7. Honours Programme Master Research

The Honours Programme Master Research is a special Honours Programme Master for students that want to prepare for a research career. This programme has additional requirements:

a. in stead of what is stipulated in paragraph 6, the student completes:

<u>code</u>	<u>subject</u>	<u>credits</u>
TIL7000	writing a research proposal	8

b. the student completes one or more subjects provided by the TRAIL Graduate School Training and Education program. The choice needs prior approval from the supervisor of the subject mentioned under a. However, these subjects are considered not to be part of the Honours Programme Master, but are considered to be free electives in the regular examination programme as mentioned in Article 5, paragraph 5.

8. Honours Programme Master Infrastructures and Environment

The Honours Programme Master Infrastructures and Environment is a special Honours Programme Master for students that are interested in potential employment in public or private organisations which deal with issues related to infrastructures and the environment. This programme has additional requirements:

in stead of what is stipulated in paragraph 6, the student completes:

<u>code</u>	<u>subject</u>	<u>credits</u>
4413UEINFY	urban environments and infrastructures	6
AR9050HPM	infrastructures and environment seminar	2

9. Students who fulfill, or will fulfill, the requirements laid down in paragraph 1, and are interested in the Honours Programme Master can send their application to the programme director for approval together with an essay in English language, containing their motivation and a proposal for the programme.

10. Students who have successfully completed the Honours Programme Master will receive a special certificate from the university with their degree certificate.

Chapter 2 – Transitional and other deficiency programmes

Article 16 – Transitional programme for students with a Dutch higher vocational bachelor's degree

1. Students with a relevant Dutch higher vocational institute bachelor's degree have to complete a transitional pre-master programme before they will be admitted to the master's degree programme.
2. The transitional programme as referred to in paragraph 1, comprises the following deficiency subjects amounting to 31 credits in total:

<u>code</u>	<u>subject</u>	<u>credits</u>
CTB1420	transport & planning	5
TB111a	probleemanalyse	5
WI1708TH1	analyse 1	3
WI1708TH2	analyse 2	3
WI1708TH3	analyse 3	3
WI1807TH1	lineaire algebra 1	3
WI1807TH2	lineaire algebra 2	3
WI1909TH	differentiaalvergelijkingen	3
WI2031TH	kansrekening en statistiek voor HBO-instromers	3

Article 17 – Transitional minor programme for students with a Dutch university bachelor's degree

1. Students with a relevant bachelor of science degree of a Dutch university that does not standard give direct admission to the master's degree programme may be eligible for a special transitional minor programme. Degrees qualifying for the transitional minor programme are mentioned in the Teaching and Examination Regulations.
2. Students eligible for the transitional minor programme mentioned in paragraph 1 have to complete this programme before they will be admitted to the master's degree programme.
3. Students admitted to the transitional minor programme mentioned in paragraph 1 must include the subjects of this minor programme in their bachelor's degree programme, amounting to 30 credits in total:

<u>code</u>	<u>programme</u>	<u>credits</u>
CT-MI-184	schakelminor transport, infrastructuur en logistiek voor BK en IO	30

4. The subjects as mentioned in paragraph 3 can be obtained within the in the bachelor's degree programme of 180 credits if the student includes them as chosen minor programme.

Article 18 – Convergence programme for students with a Dutch university bachelor's degree

1. Students with a relevant bachelor of science degree of a Dutch university that does not give direct admission to the master's degree programme may be eligible for a special deficiency programme of convergence subjects. Degrees qualifying for the deficiency programme are mentioned in the Teaching and Examination Regulations.
2. Students admitted to the deficiency programme mentioned in paragraph 1 must include the following convergence subjects in their master's degree programme, amounting to 9 credits in total:

<u>code</u>	<u>subject</u>	<u>credits</u>
WI1708TH1	analyse 1	3
WI1807TH1	lineaire algebra 1	3
WI1909TH	differentiaalvergelijkingen	3

3. The convergence subjects as mentioned in paragraph 2 can be obtained within the examination programme of 120 credits if the student includes them as free elective subjects, mentioned in Article 5, paragraph 5.

Chapter 3 – Deviate from examination programme

Article 19 – The free study programme

1. Students are free to compile examination programmes that are rounded off with a final degree audit. Such a programme needs prior approval by the board of examiners and must consist entirely or mainly of subjects given in conjunction with the degree programme but it can be complemented with other subjects.
2. The preliminary approval referred to in paragraph 1 must be presented to the board of examiners by the student in the form of a justified request.

Article 20 – Deviate from the examination programme

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

Chapter 4 – Examinations and practicals

Article 21 – Practicals

1. The subject's 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 22 – The types of examinations

1. 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.
2. Examinations pertaining to subjects provided by other programmes are to be completed in the way stipulated by or on behalf of the Teaching and Examination Regulations laid down by the relevant programme.

Article 23 – The frequencies, times and sequences of the exams

1. Written or oral examinations are to be completed at the of the teaching period in which the subject was taught.
2. The resit periods for any of the written examinations referred to in paragraph 1 are indicated in the examination timetable.
3. Practicals may be completed in the way laid down in the relevant timetables.

Chapter 5 – Transitional rules

Article 24 – Transitional rules as of 1 September 2014

1. A number of subjects belonging to the programme 2013-2014 are no longer available in their original form from the academic year 2014-2015.

2. Subjects from the programme 2013-2014 that are replaced by other subjects are:

<u>Subject in programme 2013-2014</u>			<u>Replacement subject in programme 2014-2015</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>	<u>code</u>	<u>subject</u>	<u>credits</u>
AE4456*	safety of transportation	3	CIE5811**	transport safety	4
	<i>* available until 2014-2015</i>			<i>** available from 2015-2016</i>	

3. Subjects from the programme 2013-2014 that are unchanged, but recoded only are:

<u>Subject in programme 2013-2014</u>			<u>Recoded subject in 2014-2015</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>	<u>code</u>	<u>subject</u>	<u>credits</u>
AE4444	air traffic management	3	AE4321	air traffic management	3

4. Subjects from the programme 2013-2014 that are renamed only are:

<u>Subject in programme 2013-2014</u>			<u>Renamed subject in 2014-2015</u>		
<u>code</u>	<u>subject</u>	<u>credits</u>	<u>code</u>	<u>subject</u>	<u>credits</u>
AE4441	value engineering & optimisation	6	AE4441	operations optimisation	6
AE4451	network and fleet management	3	AE4451	network and fleet planning	3
ME1403-13	advanced operations management	6	ME1403-13	advanced operations and entrepreneuring	6

5. Subjects from the programme 2013-2014 that are not replaced in the degree programme are:

<u>code</u>	<u>subject</u>	<u>credits</u>
AE4452	RAMS and human factors	6
MT725	inland shipping	2
SPM4611	transport and logistic systems from an engineering and actor perspective	6
TIL6000*	masterclasses infrastructure and environment	1
	<i>* available until 2014-2015</i>	

6. The examination programme must in any case encompass at least 120 credits. Any inconsistencies arising as a result of transitional measures will be compensated for with free elective subjects as mentioned in Article 5, paragraph 5.