IMPLEMENTATION REGULATIONS

2013-2014

INTERFACULTY
MASTER OF SCIENCE
TRANSPORT, INFRASTRUCTURE AND LOGISTICS

DELFT UNIVERSITY OF TECHNOLOGY

LIST OF CONTENTS

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 5
   Projects 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

   Parts of the annotation programme may be extracurricular. Apart from the programmes of 15 credits, there are additional requirements.

3. The student may be eligible for a special individual programme of 30 credits on top of the master's degree programme:
   - Honours Programme Master, as laid down in Article 13.

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:

code	subject	credits
CIE4801	transportation and spatial modelling	6
SPM4611	transport & logistic systems from an engineering and actor perspective	6
TIL4030	interdisciplinary fundamentals	6
WB3420-11	introduction transport and logistic engineering	6
WB3423-04	the delft systems approach	3

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:

Specialisation P – Policy: infrastructure, planning and environment, 26 credits

code	subject	credits
AE4456	safety of transportation	3
AR0190	urban sustainability	2
CIE4760	infrastructure projects: assessment and planning	6
CIE5750	transport and spatial planning for urbanized regions	4
SPM4631	transport policy	6
SPM5610	planning and design of multi-modal infrastructure networks	5

Specialisation D – Design: transport systems and networks, 27 credits

code	subject	credits
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

Specialisation O – Operations: traffic, technology and control, 26 credits

code	subject	credits
CIE4821-09	traffic flow theory and simulation	6
CIE5804-09	innovations in dynamic traffic management	4
MEI1406	control of intelligent transport infrastructures	3
CIE5805	intelligent vehicles	4
SPM9325	simulation master class	4
WB3417-04	discrete systems: modelling, prototyping, simulation & control	5

Specialisation E – Engineering: transport, logistics and supply chains, 26 credits

code	subject	credits
CIE4840	freight transportation systems: analysis and modelling	4
MEI1405	automation of transport systems	3
MEI1406	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:

Electives T&P – Transport and Planning, at least 1 subject

code	subject	credits
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

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

Electives T&L – Transport and Logistics, at least 1 subject

code	subject	credits
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

code	subject	credits
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
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

4. 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 the elective subjects as given below:

Electives C&O – Control & Operations

code	subject	credits
AE4441	value engineering and optimisation	6
AE4443	airline operations	5
AE4444	air traffic management	3
AE4446	airport operations	4
AE4451	network and fleet management	3
AE4452	RAMS and human factors	6
AE4454	life cycle analysis and production	6
AE4456	safety of transportation	3

Electives TIL – Other TIL fields

code	subject	credits
AR0190	urban sustainability	2
CIE4330	ports and waterways 1	4
CIE5306	ports and waterways 2	4
MT313	shipping management	3
MT725	inland shipping	2
TIL6000*	master classes infrastructure & environment	1
WI4062TU	transport, routing and scheduling	3
WM0320TU	ethics and engineering	3

* *cannot be chosen by non-Dutch speaking students*

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.
   a. 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.
   b. For these 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:

code	subject	credits
TIL4010-11	TIL seminars	3

Article 7 – Interdisciplinary design project

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

code	subject	credits
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 45 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 programme 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 project

1. The student is expected to complete a graduation project:

code	subject	credits
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 to 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: interdisciplinary research project and internship

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:

code	subject	credits
TIL4020-11	interdisciplinary research project	7
CIE4040-09	internship	10

2. The student is allowed to start an interdisciplinary research project or an internship as mentioned in paragraph 1, once:
   a. a total of at least 30 credits has been gained;
   b. the obligations stipulated in Article 3, the so-called fundamentals, have been met.

3. If the student does not meet at the most one of the criteria as indicated in paragraph 2, the programme coordinator may give exceptional access to the project 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:

code	subject	credits
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 the 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:

code	subject	credits
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 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 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. Participation in the Infrastructure and Environment annotation course:

code	subject	credits
TIL6000	master classes infrastructure & environment	1

   b. Subjects adding up to at least 14 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. 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 the prior approval by the programme 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 – 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 30 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:

code	subject	credits
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:

code	subject	credits
TIL4020-11	interdisciplinary research project	7

6. 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.

7. 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 14 – 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 37 credits in total:

code	subject	credits
CTB1420	transport & planning	5
CTB3420	integraal ontwerp van infrastructuur	4
TB111A	probleemanalyse	5
TB134A	statistiek 1: data-analyse	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

Article 15 – 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:

code	subject	credits
WI1708TH1	analyse 1	3
WI1807TH1	lineaire algebra 1	3
WI1909TH	differentiaalvergelijkingen	3

3. The convergence subjects as mentioned in paragraph 3 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 16 – 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 17 – Deviate from the examination programme

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

Chapter 4 – Examinations and practicals

Article 18 – 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 19 – 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 20 – 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 21 – Transitional rules as of 1 September 2013

1. A number of subjects belonging to the programme 2012-2013 are no longer available in their original form from the academic year 2013-2014.

2. Subjects from the programme 2012-2013 that are replaced by other subjects are:

Subject in programme 2012-2013			Replacement subject in 2013-2014		
code	subject	credits	code	subject	credits
ME1403	operations management	3	ME1403-13	operations management	6
ME1410	quantitative methods for logistics	3	ME1410-13	quantitative methods for logistics	6
TIL4090-11	external project: internship	10	CIE4040-09	internship	10

3. Subjects from the programme 2012-2013 that are renamed only are:

Subject in programme 2012-2013			Renamed subject in 2013-2014		
code	subject	credits	code	subject	credits
CIE5750	spatial planning for the metropolis	4	CIE5750	transport and spatial planning for urbanized regions	4

4. Subjects from the programme 2012-2013 that are not replaced in the degree programme are:

code	subject	credits
CIE4010	economics	4
CIE4751*	urban planning and transport networks	4
CIE4780**	underground space technology: special topics	4
CIE5720	environmental impact assessment	4
SC4026	control system design	3
SC4040**	filtering and identification	6
SPM9431	public private partnership	6

** still available as CT3361 in BSc-minor CT-MI-127-13*

*** still available in other degree programmes*

5. 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.