Faculty of Science, Leiden University

and

Faculty of Applied Sciences, Delft University of Technology

Masters' Programme Industrial Ecology

Implementation Regulations

Corresponding to the Course and Examination Regulations of the master's programme Industrial Ecology

31 August 2015 to 31 August 2016

Contents

Section 1 – General

Article 1.1 – Semesters and start of the study
The academic year is divided into two semesters. Students can start in the programme at two moments, at the beginning of the first semester or at the beginning of the second semester.

Article 1.2 – Admission Requirements

1. A bachelor's degree in any of the Natural Sciences, Engineering Sciences, or Social Sciences from an accredited university programme and comparable with three years of Dutch Academic Education. The application for admission shall be reviewed by the Board of Admissions.
2. For Dutch HBO students: a bachelor degree in any of the Natural Sciences, Engineering Sciences, or Social Sciences from an accredited programme and a grade point average of the entire curriculum of 7.5 or higher.
3. An additional requirement for all students is that students have a demonstrable affinity with multi-disciplinary education and research by showing course modules, summer courses, internships, or other relevant experiences that are within the endterms of the bachelor's degree, or at least at sufficient academic level, but clearly outside the main field of the bachelor's degree.
4. An additional requirement for all students is that students have a demonstrable interest in the field of Industrial Ecology and can show in a motivation letter to the admission committee at least one relevant example of the relation between his/her bachelor's education or previous experience and an academic contribution to the field of Industrial Ecology.
5. Proof of sufficient proficiency in English: IELTS test level of at least 6.5 or TOEFL score of at least 570/230, evidenced by appropriate test. This requirement does not apply if the student has:
    a. completed your education in Canada, USA, UK, Ireland, New Zealand or Australia,
    b. or an International Baccalaureate
    c. or, for Dutch students that completed VWO level English

Article 1.3 – Special tracks
The master's programme does not offer special tracks

Section 2 – Description of the master's programme

Article 2.1 - General

Industrial Ecology is an interdisciplinary scientific field aiming at analysing sustainability problems and designing and implementing solutions for such problems. Industrial Ecology field studies the technosphere, also known as the physical economy. In almost all cases, flows of energy and materials are the connection between economic activities and environmental problems. These energy and material flows are the core object of Industrial Ecology, as well as the technologies generating those flows and the socio-economic context driving technology development. The educational programme focuses on the analysis, design, and implementation of industrial systems on the analogy of ecological systems and with the least possible adverse sustainability impacts.

The master's programme Industrial Ecology consists of three parts, providing basic concepts and theories:

1. Natural Sciences of Industrial Ecology – Environmental science, Industrial Ecology analysis of technosphere systems and their relation with biosphere systems, in view of ecological sustainability, using tools such as Life Cycle Assessment, Material Flow Analysis, and ecological models.
2. Technical Sciences of Industrial Ecology – Design of technological systems, with a view on sustainable development, using tools from the realm of Design for Sustainability, Ecodesign, and Complex Adaptive Systems.
3. Social Sciences of Industrial Ecology – Implementation of socio-technological systems, among others eco-industrial parks, and implementation of sustainably sound industrial practice.

Article 2.2 - Overview of the two-year curriculum

1. Core Modules (54 EC)
2. Interdisciplinary Project Groups (12 EC)
3. Specialisation Modules (18 EC)
4. Thesis Preparation Module (6EC)
5. Thesis Research Project (30 EC)

Coursecode	**Course**	**Level**	**EC**
Core Modules (see article 2.3)		**500**	**54**
4413GEIIEY	General Introduction to Industrial Ecology	500	6
4413FSDMCY	Fundamentals of Systems, Data, Models and Computational Thinking	500	6
4413ANMT6Y	Analytical Methodologies and Tools	500	6
4413CLOSCY	Closed Loop Supply Chains	500	6
4413RENESY	Renewable Energy Systems	500	6
4413SYSEAY	System Earth	500	6
4413DoSTSY	Design of Sustainable Technological Systems	500	6
4413SUISCY	Sustainable Innovation and Social Change	500	6
4413UEINFY	Urban Environments and Infrastructures	500	6
Interdisciplinary Project Groups (see article 2.4)		**600**	**12**
4413INTPGY	Interdisciplinary Project Groups	600	12
Specialisation Modules (see article 2.5)		**master**	**18**
Thesis Research Project (see article 2.6)		**600**	**36**
4413TRP30Y	Thesis Preparation Module	600	6
4413GRPMDY	Thesis Research Project	600	30
Total of the two-year curriculum Industrial Ecology			**120**
Specialisation Modules provided by the Industrial Ecology Master's programme			
4413LCA9EY	LCA Practice & Reporting	600	9
4413EIOANY	Environmental Input-Output Analysis	500	6
4413IECS2Y	Industrial Ecology Capita Selecta Module	500	2
4413IECS3Y	Industrial Ecology Capita Selecta Module	500	3
4413IECS4Y	Industrial Ecology Capita Selecta Module	500	4
4413IECS5Y	Industrial Ecology Capita Selecta Module	500	5
4413IECS6Y	Industrial Ecology Capita Selecta Module	500	6

Article 2.3 – Core modules

These form the central part of the programme and are compulsory for every student.

Article 2.4 – Interdisciplinary Project Groups (12 EC)
In the second year, students join project groups in which they are trained to solve real-life Industrial Ecology problems, by integrating the knowledge and insights they have acquired from studying different disciplines. Students can only participate in the Interdisciplinary Project Groups if they have finished at least 48 EC of the core modules.

Article 2.5 – Specialisation Modules (18 EC, level 400/500/600)

1. Specialisation Modules are at master education level, i.e. for Leiden University with a level 400 or higher, or for Delft University of Technology or other universities the course has to be from a master's programme or comparable.
2. The knowledge and skills obtained from at least 12 EC of the Specialisation Modules have to be relevant for the field of Industrial Ecology, and preferably, to the topic of the Thesis Research Project.
3. The master's programme Industrial Ecology offers some Specialisation Modules as presented in Article 2.2.
4. Admission criteria for Specialisation Modules offered by other programmes can obtained from those programmes i.e. the e-study guide of the module.
5. The choice for Specialisation Modules has to be approved by the Board of Examiners before the start of the course or study component. A request for a Specialisation Module should be submitted by the student to the BoE via the studyadvisor. This request should be accompanied by a letter of motivation and course description, except for courses that are on the list of approved Specialisation Modules that is provided by the Board of Examiners. The BoE shall reach its decision within twenty days of receipt of the request, and the student will be notified of the board's decision as soon as possible by the studyadvisor.

Article 2.6 – Thesis Research Preparation Module and Thesis Research Project (36 EC, level 600)

1. Students of the master's programme Industrial Ecology have to select, depending on their interest and background, a research topic in deliberation with an examiner. Students have to work independently on a research project. The Master's Thesis Research Project is composed of two modules as described in Article 2.2. As preparation to the research topic, the involved staff member can ask the student to successfully finish specific Specialisation Modules, this has to be discussed with the student before the Master's Thesis Research starts.
2. Students can only start the Thesis Research Project if:
   - At least 48 EC of the core modules is sufficiently completed.
   - The module 4413INTPGY Interdisciplinary Project Groups is sufficiently completed
   - The module 4413GRPMDY Thesis Preparation Module is sufficiently completed and gradeform and report are handed in to the studyadvisor.
   - The Individual Study Programmme (ISP) is approved by the Board of Examiners

- The Thesis Research Form is completed handed in to the studyadvisor.
- As preparation to the research topic, the involved examiner can ask the student to successfully finish specific Specialisation Modules, this has to be discussed with the student before the Thesis Research Project starts.

Article 2.7 – Composition of the individual study programme

1. Each student shall propose an individual study programme (ISP) after having consulted with the study advisor. An ISP must satisfy the final terms as described in the Course and Examination Regulations (OER) and Implementation Regulations and is subject to the approval by the Board of Examiners.
2. Each individual study programme must be submitted to the studyadvisor for approval by the Board of Examiners before the start of each semester.
3. Adaptations to the individual study programme throughout the semester are likewise subject to approval by the BoE.

Article 2.8 – Approval of Specialisation Modules and other adaptations of the individual study programme

The Board of Examiners makes a decision with regard to the students' Specialisation Modules and other adaptations of the individual study programme within 20 working days following the submission of the proposal.

Section 3 – Date of commencement

These regulations come into force on 1 September 2015. These regulations have been decreed by the Deans of the respective faculties together with the Course and Examination Regulations of the Master's Programme Industrial Ecology.