**Programme-specific appendix to the OER 2018-2019**

For the Master of Science programme

# Environmental and Energy Management (MEEM)

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# 1. Structure and Units of Study of the programme

### *1a Program content*

The MEEM programme aims at preparing for jobs in companies, government and non-governmental organisations as internal and external consultants / environmental, water or energy (project) team members, civil servants and researchers in the domain of sustainability science, with specializations in and across environmental, water and energy management. Thus MEEM can be categorized as an academic professionally oriented master programme.

The content of the program is characterized by:

- Attention to both the private and the public sector with respect to environmental, water and energy management;
- Multidisciplinarity:
  - insights are derived from various disciplines in the domain of social sciences and humanities, with in MEEM a strong orientation on sustainability issues (e.g. policy science, economics, legal sciences, (basic) natural / technical sciences and (organizational) sociology) as well as social science research methods and techniques, specialized in environment, water and energy management;
  - the ability to apply disciplinary knowledge and insights in mutual connection on questions of environmental, water and energy management and sustainable development in a broad sense;
- Stimulating the interaction between participants with their insights and experiences, in line with the postgraduate character of the programme;
- A professional and academic master programme.

### *1b Study Load*

The MEEM has a total study load of 60 EC

***Table 1*: The MEEM course list for 2018-2019**

| C | Course code | Name | EC | Exam |
|---|---|---|---|---|
| 1 | 201700115 | Policy Strategies and Implementation for Water Governance and other Sustainability Issues | 4 | PS |
| 1 | 201700113 | Environmental Law | 2 | S + PS |
| 1 | 201700116 | Energy Management | 4 | S |
| 1 | 201700136 | Management: operations, organizations and financial analysis | 4 | S + PG |
| 1 | 201700134 | Science Backgrounds: Environment and Technology | 4 | S + PS |
| 1 | 201700114 | Sustainable Management Strategies and Innovations | 4 | S + PS |
| 1 | 201700133 | Science Backgrounds: Ecology, Society and Sustainable Development | 2 | PGR/PG + AP + PS |
| 1 | 201700043 | Academic Research Skills | 4 | PR + PS |
| 2 | 201700159/157/160 | Case study period (Environmental or Energy or Water) | 12 | PGI/PGR |
| 3 | 201700211 | Thesis project | 20 | BAM |

This structure is foreseen for students who begin the program in September 2018. The following abbreviations are used under the 'Exam format' column:

S = written exam
PGI = group assignment, including a written group report and (in so far as possible) individual assessment of the manner in which the student participated in the group exercise
PG = group assignment, including a written group report and the assessment of this report

for the group
PS = individual assignment, including a written report
PGR = group assignment and oral report of this through a presentation
PR = individual assignment and oral report of this through a presentation
BAM = reviewed in accordance with the procedures laid down in the regulations applicable to the Master's assignment.

***1c Programme structure***

The MEEM is divided into three components: course work (1), case study (2), and research project (3). The course work is common to all students; the case study and research project are based on the specialization streams. The buildup throughout the programme takes place in three areas: from stand-alone courses in the course-work period, via integration subject and pre-structured work in the case period, towards the final individual research project.

During the course work period, the core substantive courses are structured around the theme Governance and management of socio-technical change and organization. They provide the (mainly) disciplinary knowledge in the different environmental, water and energy management areas. Next to these courses, the course on Academic Research Skills is more integrative in nature and the programme also involves professional skills. In general, there are many interlinks between courses.

While the course work period is common for all students, in the next two phases, of the case studies and the thesis research project, students choose a specialization:

The Environmental Management specialization deals with:

- To **understand** the problems and challenges involved in the greening of industry strategies regarding the environmental and social sustainability;
- To **analyse** the management strategies at different scales (firm, supply chain, sector and region) towards a more socially inclusive (stakeholders engagement) and greener industry;
- To **design** environmental and socially inclusive management systems that cope with the industrial challenges of delivering sustainable products and services;
- To **manage** the greening of industry transition by engaging systematically the relevant stakeholders and by implementing the adequate sustainable management strategy.

The energy management specialization teaches you:

- To **understand** the problems and challenges involved in the transition to sustainable energy supply at different scales (market, region, community or organization);
- To **analyse** energy supply chains at different scales in their transitional problems and needs;
- To **design** adequate sustainable solutions for sustainable energy supply at different scales;
- To **manage** the transition to sustainable energy supply at different scale.

The water governance specialization teaches you:

- To **understand** the problems and challenges involved in reaching out for sustainable water resources and safe and affordable water supply (such as pollution, droughts, floods, salinization, soil subsidence, increased water demand, infrastructure and governance).
- To **analyse** the governance of water systems and water supply services and to assess the potential for improvement, the potential for innovation and restricting and supportive conditions.
- To **design** options for improvement, based on promising key concepts, design approaches and design principles in water governance, applying multidisciplinary and multi sectoral perspectives, focussing on strategies, plans, measures and instruments.
- To **manage** the implementation of strategies, plans, measures and instruments and continuation of good water governance.

Both in the case study period as in the thesis project there may be opportunities to substantively make links between different specializations.

***Content of practical exercises:*** A characteristic of the instructional approach in the MEEM

programme is a strong link between theory and practice. This calls for active and collaborative learning, and teaching methods that enable this. Thus, in most courses practice-oriented application of concepts is used to teach participants (how) to use them in practice and to reflect upon the context in which tools and concepts are or can be used. This, in turn, gives rise to discussion in class, in which participants learn from each other and from the situation and solution strategies used in various countries. Active and collaborative learning by students is promoted by including e.g. assignments, workshops/interactive classes, case study and the research project.
In view of the fact that MEEM takes a view that connects global with local issues and that invites students from across the world, many programme elements specifically connect to local issues across the world, such as of participants' home situations.

The program has a MSc accreditation in the domain of "social science oriented environmental science".

# 2. Goals/objectives and final attainment targets

### *2a Goals/objectives*

The aim of the MEEM is to develop the professional knowledge and skills of participants in the area of sustainability science, through active and collaborative learning at an academic level, taking into account the (educational, professional, and geographical) backgrounds of the participants.

The primary focus of the MEEM programme is to prepare graduates for a professional career for which academic education is important. As such, it aims to equip its participants with the necessary knowledge and skills to be able to work on and design solutions for multi-disciplinary problems in environmental, energy or water management. This is reflected in the final attainment levels, which show a focus on application and integration of models, theories and tools, a critical attitude towards the appropriateness of potential solutions in their specific context, and attention for assignments and project work focused on analysis and design of solutions. At the same time, graduates are also equipped to work in (applied) academic research in the area of environmental, water and energy management.

The aims and final attainment targets of the MEEM are derived from those needed to function effectively at an academic level in the public and /or private sector, or to conduct (applied) academic research in the area of environmental, water or energy management.

### *2b Final attainment targets*

The aim of the programme is reflected in its final attainment targets. The final attainment targets for the Master of Environmental and Energy Management are:

*Domain Specific Final attainment targets*

1. Graduates have knowledge of and insight in the relevant key concepts and theories of policy studies and law and can describe and categorize relevant policy instruments, describe the legal basis of common policy instruments used in environmental, energy and water management and are able to assess their usefulness and feasibility in various contexts.
2. Graduates have basic knowledge of and insight in a variety of clean(er) and treatment technologies relevant for environmental, energy and water management, and tools that can be used for assessing the options for improving the environmental and energy impacts of products and production processes. They are able to make basic calculations for some of these tools and to make judgments about what technological solutions are appropriate for specific situations.
3. Graduates have knowledge of and insight in relevant key terms and concepts of organizational theory, operations management and financial analysis. They are able to apply these to analyze (energy, water and environmental projects in) an organization, define needs for change and advise about implementation.
4. Graduates have knowledge of and insight in the relevant key concepts, theories and tools, strategies and management systems for corporate environmental, energy and water management.

Graduates are able to analyze an existing situation and design solutions for (a specific issue in) environmental, water or energy management.

*Integration / multidisciplinarity related Final attainment targets*

5. Graduates understand the concept of sustainable development and the relationships between resource utilization, production processes, societal processes and environmental pressure and are able to apply combinations of concepts and theories in environmental, water and energy management to the situation in their home country or other specific real life situations.
6. Graduates are able to integrate knowledge from various disciplines and to understand interrelationships in sustainable development processes, and are capable of formulating an action programme, policy, project or recommendations for environmental, energy or water management issues in their context based on this integrated knowledge.

*Academic and Professional Final attainment targets*

7. Graduates have academic and research skills, such as critically reflecting on literature, designing a research proposal and executing and reporting on an (applied) research project.
8. Graduates are able to independently access relevant scientific literature to obtain additional knowledge and apply this to the problem at hand.
9. Graduates can take the responsibility for the continuous development of their own knowledge and skills.
10. Graduates are able to make a relevant contribution as an individual or as a member of an multi-disciplinary team to analyzing and solving complex environmental or energy problems in an organization or region. They are able to function in an international team, with English as the language of communication.
11. Graduates are able and willing to recognize the ethical aspects related to their activities.
12. Graduates are able to give a structured written and oral presentation in English about individual or team-work. They also adhere to existing academic traditions, such as providing proper credits and references.
13. Graduates are able to reflect on matters and issues in the domain, are able to form an opinion and to contribute to both scientific and practitioners' discussions and e.g. to critically reflect on the role of technology in the process towards sustainable development
14. Graduates have knowledge of the principles of relevant professional skills, like communication, management and consulting skills, and have some basic experiences in applying these

***Table 2:*** **Dublin Descriptors and final attainment targets of MEEM**

| ***Descriptor*** | ***levels*** |
|---|---|
| *Descriptor 1: Knowledge and understanding*<br>Have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with Master's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context | 1,2,3,4,5,6,14 |
| *Descriptor 2: Applying knowledge and understanding*<br>Can apply their knowledge and understanding and problem solving abilities in new of unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study; have the ability to integrate knowledge and handle complexity | 1,2,3,4,5,6,7,8<br>11,12,13,14 |
| *Descriptor 3: Making judgments*<br>Can formulate judgments with incomplete or limited information, including reflections on social and ethical responsibilities linked to the application of their knowledge and judgments | 1,5,6,7,10,11,13 |
| *Descriptor 4: Communication*<br>Can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously | 7,10,12,13,14 |
| *Descriptor 5: Learning skills*<br>Have the learning skills to allow them to continue to study in a manner that may be largely self-directed of autonomous | 7,9 |

As can be seen from table 2, the final attainment targets of the MEEM match those of the Dublin Descriptors for master's programmes. Also, in developing the final attainment targets, the Criteria for Academic Bachelor's and Master's Curricula of the 3TU were used to check consistency and

comprehensiveness.

# 3. Examination and exams

### 3a. Examination

The programme has one examination, the Master's examination at the end of the year. The Master's examination is deemed to have been successfully completed if the exams of the units of study, including the Master's thesis, have been taken successfully

### 3b. Exam formats

The exam formats of each of the units of study (courses) in the MEEM programme is shown in table 1.

Because the MEEM belongs to the Faculty of Behavioural Management and Social Sciences, it operates within the general rules on education and exams as set by the University and the Faculty, the main being the OER (Onderwijs- en examen regelement; Education and Exam Rules). Specific regulations, procedures and requirements with respect to MEEM exams are laid down in the 'exam regulations' in the study guide.

The duration of the programme is one year. With regard to the course work (that is, all the items except the case study and thesis research project), during this year there will be in principle two opportunities offered to pass an exam: the regular exam and the re-exam. Students are automatically registered for the regular exams and, if needed, and consequently only in case of a fail mark, for the re-exams. When a student does not attend an (re-)exam without informing the lecturer beforehand, then this (re-) exam will nonetheless be classified as a valid exam opportunity.

For assignments a division is made between improvement of an assignment and creating a new assignment. In the course descriptions for each course further information is provided on which of the following options is applicable:

1. Short assignments, approximately 1 – 1.5 page. For these assignments making later improvements is not possible; in case of a fail, students should create a complete new assignment.
2. Assignments (other than 1.) which allow the possibility for a feedback moment to improve the end result. For these assignments it will not be possible to create a new assignment; improvements should be made using the instructions during the feedback moment.

If a unit of study has been completed (i.e. passed with at least a 5.5 or 6.0) this grade is final.

In case of special personal circumstances, students may be allowed an extra opportunity to take an exam or do an assignment. To apply for this, the student must make a request, in writing, to the Examination Board of the programme. In the case study period and the research project, there is no second opportunity to repeat compulsory elements of these courses. Again, in case of special personal circumstance (beyond personal control, such as serious illness or accidents) the Examination Board and programme management will try to find a solution upon a student's request.

The procedures for the part of the exam called Research project (master's thesis) are outlined in the specific manual 'Guidelines for the Research project'. The procedures described in this manual are assumed to be part of the Students' charter.

### 3c. Period of validity of test results

In conformity with paragraph 4.8 of the common elements of this EER, in the master of Environmental and Energy Management, a result of a unit of study has no limitation. Separate tests within a unit of study are valid only within the academic year in which they were obtained. In case of compelling personal circumstances the Examination Board may allow an extension of the latter term of validity.

**3d. Required sequence of exams**

There are no prior knowledge prerequisites in the MSc other than being admitted to the programme

# 4. General information

### *4a Admission to the programme*

- Admission requests for the program are assessed by an admission committee that consists of both programme coordinators and two examiners.

- The standard admission criteria are as follows:
  - have at least a Bachelor's degree in a related discipline in the following programmes of natural, technical, environmental or social sciences at a research university of university of applied science:

    A. Natural, Technical and Environmental Sciences
    Bachelors in the field of Engineering Sciences, Technical Sciences, Natural Sciences (chemistry, physics, geology, biology, ecology, etc.), Environmental Studies / Sciences, agricultural / forestry Sciences, Earth Sciences, natural resources management, Environmental Health Sciences

    B. Social Sciences
    Bachelors in the field of Business / Business Administration / Commerce, Policy Studies / Political Science, Economics, Law, Management / accounting sciences, Public Management, Environmental / Natural Resource / agriculture / forestry Management, Public Health, (physical, regional, economic) Planning sciences.

    NB1 - When the bachelor degree in a program of the above lists has been obtained at the level of a university of applied science, then admission may be possible only upon completing (parts of) the MEEM premaster program (with a minimum of 5 and a maximum of 30 EC). The admission committee provides assessments on whether this is necessary and if so, to what extent – the MEEM program director takes the final decision..
    NB2 - Second class lower bachelors provide access to the MEEM programme only when complemented with respectively 2 years of relevant work experience or ample (≥5 yrs) relevant work experience and a convincing motivation.
    NB3 Applicants with a Bachelor that is not in the Natural, Technical, Environmental or Social Sciences, as listed in the above can only be admitted when possessing at least 5 years of directly relevant work experience, or upon completion of (parts of) the MEEM premaster program. The admission committee advises on admissibility to this program; the MEEM program director takes the final decision.

  - proper proficiency in the English language, at least a minimum score of 6.5 on the Academic IELTS test, or a score of at least 90 on the Internet based TOEFL-iBT test. Upon request the admissions committee provides assessments on whether an at least equivalent level of proficiency is secured in another way, such as by native language or language in a completed bachelor or master programme.

- For a positive assessment the relevant diplomas and transcripts as proof of the above have to be certified. In case work experience is a necessary condition to admittance, a CV and motivation letter are required.

To prevent enrolment of students who are not fit for MEEM, all students have to enclose with their admission form a motivation letter and a CV in which they demonstrate that they have sufficient affinity with (reflection on) sustainability sciences.

The management of the programme may, in divergence from what is stated in the above, grant to prospective students that do not yet fulfil the requirements for admission, the opportunity to follow certain parts of the master.

### **4b Language**

The MSc Environmental and Energy Management is taught in English. Not only does this mean that courses are given in English, but also that all course materials (textbooks, readers, etc.) will be in English, as well as all tests, exams and practical exercises (specifically the Master's project/thesis)

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### 4c International agreements

The MEEM programme has a positive attitude towards international cooperation and actively explores opportunities for this.
Starting 2009-2010, cooperation with the University of Padjadjaran (Bandung, Indonesia) in the form of a Double Degree programme, was launched and is still successful today. Further, many of the lecturers involved in the MEEM programma are 'internationals' themselves, are part of international networks and / or participate in international research or educational activities.

### 4d Elective options

Not applicable, because the programme does not have a 'vrije ruimte' (i.e. elective credits), except for the choice of specialization and research project topic.

### 4e Programme Committee (OLC)

The tasks of the programme committee are:

- To give advice on the Education and Examination Regulations (OER)
- To assess yearly the execution of the Education and Examination Regulations (OER)
- To give advice - asked or unasked - to the management of the programme and to the Dean on all matters with respect to the concerned education.

The programme committee of MEEM consists of three lecturers and three students. The programme committee is supported by the two MEEM programme coordinators. The programme leader can also participate in the OLC-meetings.

### 4f Examination Board

The Examination Board is the body that determines in an objective and expert way whether a student meets the conditions under the Education and Examination Rules (EER) concerning the knowledge, comprehension and skills required in order to obtain the Master of Science (MSc) degree. The Dean of the Faculty appoints members of the Examination Board.

The Board's tasks are described in paragraph 5.1 of the generic (i.e. non programme-specific) part of the EER. More information, including the most up-to-date composition of the Board can be found on the webpage of the Examination Board.

# 5. Additional information

### *5a Graduation with distinction*

If upon sitting the Master's examination, the student has shown evidence of exceptional capability, 'cum laude' will be recorded on the degree certificate.

A student is considered to have exceptional capability if each of the following conditions is met:

- All requirements for completion of the Master programme are met;
- the non-weighted average grade for the coursework (not including the research project and courses that are assessed using 'Pass' or 'Fail') is 8.0 or higher;
- all educational items have been passed
- for the educational items that are assessed using grades, the minimum grade should be a 7,0 or higher.
- the grade for the research project is 9.0 or higher;
- The programme is completed within a period of 15 months.