

## **Programme-specific appendix to the OER 2016-2017**

For the post-graduate 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 has an orientation as a postgraduate and academic programme that 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 environmental science, specialized in environmental, water and energy management. It thus can be categorized as a postgraduate, professional and academic master programme.

The content of the program is characterized by:

- Attention for 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 environmental sciences (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;
- Scientific nature;
- High quality;
- Stimulating the interaction between participants with their insights and experiences, in line with the postgraduate character of the programme;
- A postgraduate, professional and academic master programme.

## 1b Study Load

The MEEM has a total study load of 60 EC

**Table 1: The MEEM program for 2016-2017**

<b>Educational Items</b>	<b>ECs</b>	<b>Contact hours (appr.)</b>	<b>Exam format</b>
<b>Courses (joint programme)</b>			
Policy Strategies and Implementation for Water Governance and other Sustainability Issues	4	36	PS
Environmental Law	2	18	S + PS
Energy Management	4	36	PG
Management: operations, organizations and financial analysis	4	36	S + PG
Science Backgrounds: Environment and Technology	4	36	S + PS
Sustainable Management Strategies and Innovations	4	36	S + PS
Science Backgrounds: Ecology, Society and Sustainable Development	2	18	PGR / PG + AP + PS
Total	24		
<b>Academic Research Skills</b>			
	4	30	PR + PS

Consultancy workshop	0	12	
Impact Assessment workshop	0	6	
Total	4		
<b>Case study period</b>			
Environmental Management specialisation	12	~48 (variable)	PGI / PGR
<b>OR</b>			
Energy Management specialisation	12	~ (variable)	PGI / PGR
<b>OR</b>			
Water Governance specialisation	12	~ (variable)	PGI / PGR
Total	12		
<b>Research project (specialised programme)</b>			
Research project	20	~8 (variable)	BAM
Grand total	60		

This structure is foreseen for students who begin the program in September 2016. The following abbreviations are used under the 'Exam format' column:

- S = written exam
- M = oral 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
- AP = active participation is obligatory
- 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, case study, and research project. 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 courses are structured around the themes of Management, Governance and Technology. They provide the (mainly) disciplinary knowledge in the different environmental, water and energy management areas.

Next to the courses on the three themes, courses or course elements are included that are more integrative in nature, and also workshops / courses concerned with academic research and professional skills. In general, there are many interlinks between courses.

The course work period is common for all students. After this, for the case studies and research project, students choose a specialization:

- 1) Environmental Management  
Strategies towards sustainable regional development, resource efficiency, greening networks, eco-innovations & building with nature. Or an environmental problem brought in by one of the students.
- 2) Water Governance  
The topics are related to water & energy, water & nature, or some related issues faced by practitioners: irrigation, drought, coastal management, water governance, knowledge management and transfer.
- 3) Energy Management  
The Energy Management course teaches students the need of a rational use of energy in markets, regions, cities, communities and industries and the knowledge and tools to innovate and optimize current energy production and use in the Global North and Global South.

**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 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 learning by students is promoted by including e.g. assignments, workshops/interactive classes, short courses, case study and the research project.

In view of the international postgraduate nature of MEEM, many programme elements specifically use this application of theory and concepts to provide a link to the home.

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 through active 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, water or energy 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, water and energy 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, water and energy 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 judgements 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, water and energy management, including Corporate Social Responsibility. Graduates are able to analyze an existing situation and design solutions for (a specific issue in) environmental, water or energy management.

*Integration / multidisciplinary 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 the 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, water or energy management issues in their context based on this integrated knowledge.

*Academic and Professional Final attainment targets*

7. Graduates have academic and research skills like 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 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 a 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**

<b>Descriptor</b>	<b>levels</b>
<i>Descriptor 1: Knowledge and understanding</i> 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
<i>Descriptor 2: Applying knowledge and understanding</i> 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 11,12,13,14
<i>Descriptor 3: Making judgments</i> 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
<i>Descriptor 4: Communication</i> 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
<i>Descriptor 5: Learning skills</i> Have the learning skills to allow them to continue to study in a manner that may be largely self-directed or 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 reglement; Education and Exam Rules). Because of its post-graduate character, some items are addressed in a different manner than in initial education of the School. 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 research project), during this year there will be in principle two opportunities offered to pass an exam. There will be an exam and a re-exam. Students are automatically registered for the exams and, if needed, the re-exams. When a student does not enter an (re-)exam without informing the lecturer beforehand, then this (re-) exam will still be classified as a valid exam opportunity.

In special circumstances, students may be allowed an extra opportunity to take an exam. To apply for this, the student must make a request, in writing, to the Examination Board of the programme. For practical exercises and projects, e.g. the case study period and research project, there is no second opportunity to repeat these elements of the course. In cases of serious illness or accidents or other situations beyond control of the student, the Examination Board and programme management will try to find a solution.

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 addition to paragraph 4.8.2 of the common elements of this EER, in the master of Environmental and Energy Management, a result of a test (part of an exam of a course or another unit of study) is valid for two years.

#### 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 the programme leader and the two programme coordinators.

The standard admission criteria are as follows:

- have at least a Bachelor's degree in a related discipline in the natural, technical, environmental or social sciences. For more details, see next section. Second class lower and third class 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.
- work experience is recommended or, depending on disciplinary background, required (see next section)
- have a basic understanding of chemistry (high school level)
- have excellent communication skills and a very good understanding of the English language
- demonstrate sufficient proficiency in English by means of 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.

Further, for a positive assessment the following is required:

- A letter showing motivation and expectations that match with the programme
- Positive recommendation letter(s)
- CV
- Relevant diplomas and transcripts have to be certified.

#### - Requirements prior education and work experience

With respect to the disciplinary background and work experience mentioned above, the following criteria apply:

##### *1. Admission based on relevant disciplinary background*

Candidates with a Bachelor in the following fields can be admitted:

###### 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.

For applicants with an educational background in these areas, work experience is recommended.

##### *2. Admission based on prior education plus expertise*

Candidates with other Bachelors in the Natural, Technical, Environmental or Social Sciences can be admitted based on at least 3 years of work experience that includes some tasks related to knowledge / skills covered in the Master Programme, or when there are several relevant items in the prior education.

##### *3. Admission based on work experience and Bachelor's degree*

Applicants with a Bachelor that is not in the Natural, Technical, Environmental or Social Sciences (here referred to as Human Sciences) can be admitted when possessing at least 5 years of directly relevant work experience. That is, the experience entails many tasks that relate to the skills and knowledge covered in the MEEM programme.

The standard procedure includes finetuning, e.g. with respect to IELTS, potential over-qualification or potential mismatches.

In individual cases, programme management can deviate from the admission requirements. However, not with respect to the Bachelor's degree and only if management has good reasons to assume that the applicant has enough background and motivation to complete the programme successfully. In those cases, the situation is discussed with the applicant. Usually, the responsibility for the lacking item lies with the applicant.

#### - Other provisions

The management of the programme may, in divergence from what is stated before, to persons that do not yet fulfil the requirements for admission, give the student the opportunity to follow certain parts of the master.

#### **4b Language**

The MSc Environmental and Energy Management is taught in English. This means not only 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)

#### **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 programme 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', 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 Teaching and Examination Regulations (OER)
- To assess yearly the execution of the Teaching 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 of the lecturers and three students. The programme committee is supported by the two MEEM programme coordinators. Also the programme leader participates in the 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 Teaching and Examination Rules (TER) concerning the knowledge, comprehension and skills required in order to obtain the Master of Science (MSc) degree. Members of the Examination Board are appointed by the Dean of the Faculty.

The Board's tasks are described in paragraph 5.1 of the generic (i.e. non programme-specific) part of the TER. 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 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 or higher.
- the grade for the research project is 9.0 or higher;
- The programme is completed within a period of 15 months.

### **5b Transitional arrangement registration change MEEM**

In the beginning of 2017 the MEEM expects to receive a new CROHO-number and the registration of the program is expected to change from a non-government funded program (niet-bekostigd) to a regular national funded program (bekostigd).

We describe here the consequences this might\* have for different students groups within the MEEM, differentiated by:

- (1) the status of either non-EU or EU/Dutch student;
- (2) the study year;
- (3) date of graduation before or after new CROHO-registration change.

*Please keep in mind that at this point in time we cannot be sure about the all/exact consequences. If you think this is relevant to you, keep a close eye on official information about MEEM and when I doubt, ask for information with one of the MEEM officials.*

We distinguish here in consequences in terms of diploma, student status and financial consequences

#### **Diploma**

There will be no change in terms of the academic value or status of the MEEM diploma from the University of Twente after the registration change.

For all students from study year 2016-2017 the registration change means that they will receive a diploma based on a 60 EC curriculum. For all students from previous cohorts that graduate before the registration change this means that they will receive a diploma based on the old curriculum of 65 EC. For all students from previous cohorts that graduate after the status change this means that they will receive a diploma based on 60 EC plus a diploma supplement for the extra 5 EC they took.

#### **Student status and registration**

There are no consequences for the student status other than the category label under which the students are registered in the university administrative systems. All groups of students mentioned above are and will be University of Twente students.

Concerning the student registration due to the new CROHO status there are no changes for study year 2016-2017 students in terms of admission rules and procedures (see 4a). When the MEEM admission rules and procedures deviate from the standard university of Twente admission rules, the

rules as specified for MEEM have priority. For instance: MEEM has only one starting date per year, not two as some other programs do.

<https://www.utwente.nl/ces/studentsservices/inschrijven/inschrijving/inschrijvingsregeling-2016-2017/>

For students of study year 2016-2017 and older cohorts the educational program will take care of potential administrative changes necessary after the program registration change. We expect from non-EU students and Dutch and EU-students that they collaborate with the program coordinators to fulfil the (small) administrative obligations the registration change might bring for the education program. When needed also Dutch and EU-students are responsible for making administrative changes in their own fellowship programs. Of course the possible need for such actions will be communicated.

### ***Financial consequences***

The fee, before or after tuition waiver, for all students of study year 2016-2017 will not change after the registration change. (Please do keep in mind that this fee applies to one year of studying in the MEEM program and that, as a rule, extension of registration comes at the cost of the same fee – with only extraordinary circumstances being excepted.)

Benefits that MEEM-students might have in comparison to other UT-students, for instance in terms of some free literature and excursion costs, will stay in place in the whole study year 2016-2017.

For students from older cohorts than study year 2016-2017 that graduate before the registration change the existing MEEM regime of delay fees will remain valid. For students from older cohorts that graduate after the registration change, they will have to pay the normal fee for the months they still have to study to graduate according to the university rules.

<https://www.utwente.nl/ces/studentsservices/geldzaken/collegegeld/collegegeld-2016-2017-nl/>