

**Curriculum for
The Master of Science in
Environmental and Resource
Management
Cand. techn. soc.**

Curriculum for Environmental and Resource Management

This curriculum has been prepared under powers conferred by

Executive Order No. 338 of 6 May 2004 of the Ministry of Science, Technology and Development on Bachelor and Master's Degree Studies at Universities (the Education Order) as amended

and

Executive Order No. 867 of 19 August 2004 of the Ministry of Science, Technology and Development on the Examinations of University Degree Studies (the Examination Order) as amended.

The Study Board may, when justified by exceptional circumstances, grant an exemption from the curriculum rules determined solely by the University.

The curriculum applies to students commencing the Master's of Science in Master's of Science in Environmental and Resource Management as from September 1, 2009.

The curriculum was approved on 21. April by

Study Board of Environmental Planning

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1. The overall objective of the study

The master of science is a research based full-time study qualifying the student to carry out business functions independently on the basis of his/her knowledge and methodical skills within one or more specialist fields. A specialist field consists of a course or a group of related courses within the specialist field of social sciences.

The objective of the postgraduate degree course is to:

- expand the student's specialist knowledge and skills and to increase his/her theoretical and methodical qualifications and independence compared with the bachelor level.
- enable the student to make thorough specialist in-depth analyses through use of advanced elements of the disciplines and methods of the specialist field(s) that will further develop the student's competence to discharge more specialised business functions and to participate in scientific development work, and
- make the student qualified for further education, including a PhD course, cf. Executive Order on the PhD Degree Course and the PhD Degree (the PhD Order)

The objective of the Master of Science in Environmental and Resource Management (ERM) is to qualify the student to identify, formulate and solve complex problems attached to the use and conservation of environmental and natural resources by acquiring specialist, theoretical and methodical qualifications. And to make the student qualified to participate nationally and internationally in interdisciplinary teams to solve complex tasks within the environmental and resource area in planning, administration, innovation, management and communication.

The Master of Science is designed to attract students with a bachelor degree in biology, chemistry, environment, geography and environmental and resource management, and students with a bachelor degree within social science and social economics but also students with a technological and engineering education with elements of the above. The fundamental demands are that the

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students want to bridge the gap between natural science and technology and social science by obtaining knowledge and tools for an efficient management of environmental and natural resources.

The study is in English.

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1.1 Competence description for the Master of Science in ERM

The most important competence the student obtains is specialist and methodology tools in social science and natural science/technology in order to obtain knowledge to understand complex environmental and resource problems and to find sustainable solutions.

This demands a thorough understanding of both the problems themselves and the organisational possibilities/restrictions attached to the development within the area.

More specifically the competences that the student obtains by following this programme are described from the following three central elements in the programme, the technological/natural science domain and the behavioural/social domain and the connection between these two. In the technological/natural science domain importance is attached to competences related to natural resources and the environmental characteristics and the technological dimension of using and processing material, energy and the environment. In the behavioural/social domain competences are important within the most efficient exploitation of natural resources and the environment as part of the economic system and also the interaction between partners, the environment and natural resources. Competences which enable a coupling of these domains are developed by selected courses, projects, study groups and the final thesis.

1.2 Commercially relevant competences after graduation

The Master of Science in Environmental and Resource Management enables the student to work within fields where knowledge of social conditions as well as nature and technology is demanded. This concerns all kinds of management of nature, environment and resources, physical planning and management of the behaviour of companies and organizations. The education gives competences within international and developing work in these fields and in this way gives competences demanded both in consultant firms, in national and international organizations and in local, regional and national public institutions.

The programme serves business leaders, who must consider environmental impacts of their decisions and must develop competitive advantage within an ecological constrained world. It is also important for environmental leaders who need business

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skills and who need to include natural science/technical and economic issues in their proposed solutions to environmental problems.

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2. Organization etc.

The Master of Science consists of a number of modules. A module is a course element or a group of course elements the objective of which is to provide the student with an entirety of professional qualifications within a fixed timeframe stated in ECTS points and completed by one or more examinations within certain examination terms stated and delimited in the curriculum.

The Study Board's additional provisions:

2.1 The structure of the study

The Master of Science consists of modules of problem-oriented studies of the technological development and organisation of production, the development of consumption patterns and the social background, the nature given resources and terms as a condition for production and consumption, the effect of the production and consumption development on environment, resources, everyday life and conditions of employment as well as resource and environmental policy, planning and regulation.

2.1.1 Study composition

The study is composed of courses offered by Aalborg University Esbjerg with a subject matter of engineering and technology and courses offered by University of Southern Denmark with social subjects and in addition a few combination courses, project courses and a thesis. The first four quarters are following a fixed timetable (see section 4.3) and the courses are composed to focus on both social and natural science but also with variation in instruction and tests. In the fifth and sixth quarter the student is free to choose various possibilities, e.g. practical training, to study abroad, but also to prepare his own profile from a wide range of optional courses. In the two last quarter's a thesis is to be prepared, giving the student the possibility to test the competences obtained through the study on self-elected assignment (within the frames of environmental and resource management).

2.1.2 Course descriptions and examination forms

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Course descriptions and examination forms are updated twice a year. The course descriptions describe the individual course and are part of the curriculum. The course descriptions contain the information about:

- The course's Danish and English title.
- The campus town in which the course is available.
- Course level (bachelor or graduate).
- The Study Board responsible.
- The date approved by the Study Board
- The teacher responsible for the course.

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- Responsible department.
- ECTS points / man-year value.
- Special prerequisites (recommended, not required).
- Competence description.
- Course contents.
- Literature.
- Teaching periods (autumn or spring quarters)
- Form and language of teaching.
- Time of examination.
- Examination conditions (must be fulfilled in order to participate in the examination).
- Examination form, internal or external assessment and 7-point scale or passed/failed.

The maximum number of examinations after the completion of a course is three, unless the subject is offered again, and the examination form and syllabus will always be the ones currently applying.

Students are only allowed to follow courses included in the Master of Science for which they are enrolled, unless the Study Board has accepted examinations in courses not offered in their own study.

2.2 Time limit for the Master of Science

In the curriculum the University may lay down rules on how long after enrolment in the study the student is to complete the study.

Cf. Section 5 of the Education Order

2.2.1 Rules on study activities

There is no time limit for finishing the Bachelor Degree, but instead the following rule applies to study activities:

A student's enrolment will be cancelled if the student has not been active for the past two years unless the student and the Study Board/Head of Studies agree otherwise in writing. Periods of leave are not included in this period.

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Insufficient study activities mean that the student has not passed 60 ECTS as a minimum in a period of two consecutive years.

Prior to the two year time limit, the student must be offered guidance and support measures, if any, with a view to resuming his/her study activities.

Prior to the cancellation of the enrolment the student in question must be informed accordingly as well as of the date of the cancellation. If the student fails to respond or fails to attend the guidance offered, the enrolment will be cancelled.

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3. Admission requirements etc.

Access to the Master of Science requires a relevant bachelor degree or another relevant Danish or foreign degree at the same level.

Within the framework of the Education Order the University decides, which bachelor degrees that qualify for admission to the Master of Science and which special access requirements in terms of courses and their number of ECTS points the student must have obtained during the individual bachelor study in order to be eligible for admission to the Master of Science.

The University may admit applicants who do not meet the requirements but who, on the basis of a specific assessment, are considered to have educational qualifications equivalent to those mentioned above.

3.1 Bachelor of Environmental Planning

The university may admit applicants who have obtained a bachelor degree of Environmental Planning or the equivalent from a Danish or foreign university.

3.2 Bachelor of Natural Science

The university may admit applicants who have obtained a bachelor degree within natural science or the equivalent, such as geography, geology, biology, chemistry, physics, or biochemistry from a Danish or foreign university. The university may require that these students pass examinations that give the necessary specialist knowledge within social science.

3.3 Bachelor of Social Science

The university may admit applicants who have obtained a bachelor degree within social science or the equivalent, such as economics, business economics, sociology, law, political science from a Danish or foreign university. The university may require that these students pass examinations that give the necessary specialist knowledge within natural science.

3.4 Bachelor of Technological and Agricultural Science

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The university may admit applicants who have obtained a bachelor degree within technological and agricultural science or the equivalent, such as agriculture, forestry, horticulture, food technology, and engineering from a Danish or foreign university. The university may require that these students pass examinations that give the necessary specialist knowledge within natural and social science.

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4. The Master of Science study

4.1 Standard time

The standard time for the Master of Science is 120 ECTS.

Cf. Section 19 of the Education Order

4.2 Title

The Master of Science entitles the graduate to use the title Cand.techn.soc. (candidates/candidate technices socialium). In English Master of Science of Technological and Socio-Economic Planning.

The English title of the degree is Master of Science in Environmental and Resource Management.

4.3 Study structure

The Master of Science is to be a rounded study expanding the knowledge and insight obtained by the student during the bachelor study.

The University organizes the study in order to secure continuity and progression in the courses. The modularity of the study is to ensure the student the possibility to choose between profiles directed towards various business functions.

The Master of Science study comprises:

- 1) Constituent course elements for the study's special professional competence and identity corresponding with at least 90 ECTS points. This must include a master's thesis of 30 ECTS points.
- 2) Optional courses of at least 10 ECTS points.

The master's thesis is to document skills in using scientific theories and methods during work with a delimited specialist course.

The master's thesis cannot be credit transferred.

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4.3.1 Study composition for ERM

Course title	ECTS	Internal/External examination form and assessment
Research Forum	3.75	Internal. Grading: passed/failed
Environmental chemistry	3.75	Internal. Grading: passed/failed
Sustainability	7.5	Internal. Grading: 7-point scale
Resource characterization & conversion technologies of resources	7.5	Internal. Grading: 7-point scale
Project management	7.5	Internal. Grading: 7-point scale
Chemometrics process characterisation and process sampling	7.5	Internal. Grading: 7-point scale
Holistic design for sustainability: Systems, processes and products	7.5	External. Grading: 7-point scale
Innovation management	7.5	External. Grading: 7-point scale
Advanced environmental and resource economics and management	7.5	External. Grading: 7-point scale
Electives/projects/internship	30	Dependent on subject chosen
Master Thesis	30	External. Grading: 7-point scale

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The time schedule of the courses

QUARTERS	COURSES		
7 & 8	Master Thesis (30 ECTS)		
5 & 6	Alternative 1 30 ECTS from a combination of project courses, study courses and projects	Alternative 2 30 ECTS from courses taken at another university	Alternative 3 10 ECTS from a combination of project courses, study courses and projects, 20 ECTS from reporting on time spend in practice
4	Innovation management (7,5 ECTS)	Advanced environmental and resource economics and management (7,5 ECTS)	
3	Chemometrics process characterisation and process sampling (7,5 ECTS)	Holistic design for sustainability: Systems, processes and products (7,5 ECTS)	
2	Resource characterization & conversion technologies of resources (7,5 ECTS)	Project management (7,5 ECTS)	
1	Research forum (3.75 ECTS)	Environmental chemistry (3.75 ECTS)	Sustainability (7.5 ECTS)

4.4 Traineeship

It is possible for the students to combine the Master of Science study with practical training. Each student must arrange his/her practical training in consultation with the head of study. If a student wants credit transfer for one or more periods of practical training the study board can approve up to 20 ECTS if an approved report is available. In connection with the study board's approval of the practical training an advisor is appointed who will review the report.

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4.5 Study groups

Study groups can be established as a replacement of a course due to a small class (a) or as a replacement of an elective course (b).

(a) Study groups established due to a small class is carried through in an accordance with the course description expect for the teaching method.

(b) Study groups as a replacement of an elective course consists of a smaller number of students who in corporation with a teacher plans a lesson plan which is equivalent to an elective course. Study groups can be establishing on the effort by a group of students or a Department or the Study Board. There has to be at least 4 students before a study group is established. The students arrange topic and course description with a teacher and apply to the Study Board for permission. The Study Board hereafter announces permission to establish the study group. The Study Board considers application any time and study groups can be carried through independent of the quarter-system. Study groups can only be finished by a written assignment followed by an individual oral defense. The exact requirements are determined in collaboration between the Study Board, the course coordinator and the course responsible. Regarding enrolment to exam the study group shall contact their secretary in Study service.

4.6 The master's thesis

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The university must approve the assignment formulation for the Master's thesis and will at the same time stipulate a final date for the submission of the thesis and a plan for the student's thesis supervision. The thesis shall be commenced and submitted within the time frame stipulated in the curriculum of the individual study programme for the relevant size of thesis, as applicable to courses of full-time study.

If the student fails to submit the thesis by the stipulated time limit, the university may approve an altered assignment formulation within the same subject area, and will at the same time specify a new final date for submission within three months. If the student fails to submit the thesis by the new time limit, the student may obtain a third examination attempt, of the examination regulations, in accordance with the same

Reference is made to the course description of the master's thesis for information of study and the possibility of group work, enrolment and exam.

4.6.1 Procedure description

Further information can be obtained in the course description for the master thesis.

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4.7 Requirements for passing etc.

A student has passed an examination when he/she achieves the mark 02 or the assessment passed. A passed examination cannot be retaken.

If an examination consists of several sub-examinations, the mark for the total examination must be at least 02. If the total examination is passed, sub-examinations marked 00 or -3 cannot be retaken. Even if the total examination is failed, sub-examinations marked 02 or higher cannot be retaken.

It may be determined that two or more examinations must be passed within the same examination term.

It may be determined that two or more examinations must be passed with a total average mark. In that case, the average must be at least 2.0 without any rounding up.

It must be determined which marks are included in the total examination result.

It may be determined that the total examination result is expressed by means of an average figure. One decimal must be included in the calculation of the average figure. An

The Study Board's additional provisions:

The student has graduated when he/she has achieved the mark 2 or higher or the assessment passed for each individual course.

4.7.1 Examination weight and average figure

When calculating the average, the weight of the courses depends on the course's ECTS value and is included in the calculation as follows:

7.5 ECTS: included in the examination average at the weight of 0.75.

3.75 ECTS: included in the examination average at the weight of 0.375.

The thesis: included in the examination average at the weight of 3.0.

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5. Examination etc.

The following shall apply to examinations and the issuing of examination certificates:

- 1) The Executive Order on the Exams of University Studies (the Examination Order).
- 2) Executive Order on the External Examiner Institution for certain Higher Education Studies under the Ministry of Education (the External Examiner Order).
- 3) Executive Order on the Marking Scale and other Assessment (the Marking Order).

Cf. Section 66 of the Education Order

In the case of study programmes which have examination periods at the end of the autumn semester, students who have participated in ordinary examinations without passing these will have an opportunity to take re-examinations in the same examination period or in immediate extension of this, however no later than the following February. In the case of study programmes which have examination periods at the end of the spring semester, students who have participated in ordinary examinations without passing these will have an opportunity to take re-examinations in the same examination period or in immediate extension of this, however no later than the following

The Study Board's additional provisions:

5.1 Syllabus descriptions

Every half year the examination syllabus is published on the Internet. The examination syllabus is part of the curriculum. Examination will always be in the most recent syllabus.

5.2 Ordinary examination

As a main rule, ordinary examinations are held in the end of the teaching term in each quarter. This will be stated in the respective course descriptions.

5.3 Re-examination

Re-examination (new examination in the same term) for the autumn quarters is held in February and for the spring quarters in August. The Academic Board can decide to hold one more re-examination after the following semester. This will be stated in the respective course descriptions. To participate in a re-

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examination the student must have participated in the ordinary examination in the same quarter. Evaluation form will be announced after deregistration deadline (about 4 days before re-examination).

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5.4 Make-up examination

Make-up examinations are granted by the Study Board on an application accompanied by documentation of the illness, and the attempt at the ordinary examination is cancelled. Make-up examinations are held together with the re-examinations, February and August. Evaluation form will be announced after deregistration deadline (about 4 days before re-examination).

5.5 Examination conditions

Examination conditions fulfilled prior to the first ordinary examination are not to be repeated in connection with a new examination, if any.

5.6 Aids

If students are allowed aids at an examination, this means "books, notes, papers, pocket calculators etc." Aids capable of communicating inside or outside the room and which may have a disturbing effect: computers, printers, telephones etc. may never be brought into the room unless this is expressly stated in the course description.

5.7 Spelling and formulation ability

In addition to the specialist contents of a thesis and other major written assignments, the assessment must also stress the student's spelling and formulation abilities, regardless of the language in which these are written.

Cf. Section 11 of the Exam Order

The assessment of written assignments primarily covers the specialist contents. The student's spelling and formulation ability is to be given limited weight unless there are considerably marked deviations from the usual usage of specialist language. This will especially be the case in major written assignments. Relevant documented disability may result in an exemption from this provision.

5.8 Examination language

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Examinations are in Danish unless part of the examination objective is to document the student's skills in a foreign language. If a course has been taught in a foreign language, the examination must be completed in the respective language. The University may deviate from this rule.

Should it be desired examinations may be conducted in Danish provided that the lecturer is Danish speaking. The exam assignments will however be given in English. The student will at the start of the programme be asked if Danish will be the preferred examination language referring to the title of the education (see 4.2).

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5.9 Internal or external examinations

At least 1/3 of the total ECTS points of the study must be documented by external examinations. The external examinations must cover the most important areas of the study, including the master thesis.

Cf. Section 6 of the Exam Order

5.10 Marks or the assessment passed /failed

The assessment passed/failed or approved/failed may only be used for examinations covering 1/3 of the study's ECTS points. However, this does not apply to examinations transferred by credit.

5.11 Number of examination attempts

The student may have no more than three attempts at passing an examination. In unusual circumstances the University may allow a fourth or fifth attempt. The question of suitability to study may not be taken into account when assessing whether unusual circumstances exist. The student may in connection with the third, fourth or fifth attempt at an internal examination demand the presence of an external examiner.

In exceptional cases the University may make an exemption for more than five attempts, especially if the student only needs to pass a single examination to complete the study.

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5.12 Registration and deregistration for examinations

Students who register for course elements, etc., with which one or more examinations are associated, will automatically be registered for the relevant examinations. The university will at the same time stipulate a time limit for withdrawal of the registration for the examination.

If registration is not withdrawn within the time limit, the examination shall be regarded as commenced with respect to the number of examination attempts. This however shall not apply if the student is unable to participate due to illness.

When the university has stipulated a final date for the submission of the thesis withdrawal is no longer allowed. If the student fails to submit the thesis by the stipulated time limit, an examination attempt will be registered.

In exceptional cases the university may grant exemptions from

Time and place for examination is published on the internet www.sdu.dk - find your education and the page about exam. It is the students own responsibility to keep themselves informed about exam on the exam pages.

The final date for the withdrawal of registration is seven days before a written examination takes place, a written assignment is to be submitted, or an oral examination is commenced (i.e. the first day of the oral examinations). This means that if an examination is for example held on a Monday, the final date for withdrawal of registration would be the previous Monday.

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5.13 Recording of oral examinations

The student may record his/her own oral examinations.

Cf. Section 28 of the Exam Order

5.14 Examination complaints

Students must lodge any complaints about examinations or other assessments included in an examination with the University. The complaint must be reasoned and in writing.

The complaint must be lodged within two weeks after publication of the assessment. However, this deadline only applies from the date stated for the publication. The University may make an exemption from the deadline in case of unusual circumstances.

A complaint cannot result in a lower assessment than the original one.

Cf. Sections 37, 38 and 43 of the Exam Order

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6. Other provisions

6.1 Rules on credits

Course elements passed according to this Order must be equivalent to similar course elements at other universities offering the same study in accordance with this Order.

The University may accept that course elements passed according to this Order may replace course elements on another study on the same level according to this Order (credit).

The University may also accept that passed course elements for another Danish or foreign study on the same level may replace course elements according to this Order.

The master's thesis cannot be credit transferred.

Of sections 71 and 72 of the Education Order

6.2 Complaints

The student may appeal the University's decisions according to the Education Order to the Danish Ministry of Science, Technology and Development if the complaint is about legal matters. The complaint must be submitted to the University which must make a statement on which the complainant is allowed to comment within a time limit of at least one week. The University shall send the complaint to the Ministry with the statement and any comments from the complainant.

The time limit for complaints is two weeks from the date on which the complainant was informed of the decision.

6.3 Transitional rules

None.