Examination and study regulation for the Master's programme Environmental and Resource Management (ERM)

English translation, not legally binding

Study start 2021

Revised version of the Subject-Related Examination and Study Regulations for the Master's Programme in Environmental and Resource Management of 07 June 2021

In accordance with the Brandenburg Higher Education Act (BbgHG) of 28 April 2014 (Brandenburg State Law Gazette I/14 No. 18), last amended by the act of 23 September 2020 (Brandenburg State Law Gazette I/20, No. 26), pursuant to Section 5 (1) Sentence 2, Section 9 (5) Sentence 2, in conjunction with Sections 19 (2) Sentence 1, 22 (2) Sentence 1, 72 (2) Sentence 1 BbgHG and Section 1 (1) of the General Examination and Study Regulations for Master's Programmes at BTU Cottbus–Senftenberg of 12 September 2016 (Official Gazette of BTU 14/ 2016), last amended by the amendment statute of 26 January 2021 (Official Gazette of BTU 02/2021), the Brandenburg University of Technology Cottbus–Senftenberg (BTU) issues the following statutes:

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Section 1 Scope of Validity

[1]These statutes regulate the subject-specific features of the Master's programme in Environmental and Resource Management, hereinafter referred to as ERM. [2]They supplement the General Examination and Study Regulations for BTU Master's Study Programmes at BTU Cottbus–Senftenberg of 12 September 2016 (Official Gazette of BTU 14/ 2016, RahmenO-MA), last amended by the amendment statute of 26 January 2021 (Official Gazette of BTU 02/2021).

Section 2 Content profile of the study programme, programme goals

(1) [1]The Master's programme in ERM with a university academic profile has a research focus. [2]It follows on consecutively from the Bachelor's programme in Environmental and Resource Management that is offered at BTU and is also suitable for the further qualification of successful graduates of other relevant Bachelor's programmes.

(2) [1]The Master's programme in ERM is committed to the goal of internationality and interdisciplinarity. [2]The internationality results from the use of English as the teaching language (Section 4), the accreditation of semesters abroad (Section 9) and the range of topics covered by the modules. [3]The interdisciplinarity can be recognised in the combination of the specialist fields of the natural sciences, technology, socio-economics, and management.

(3) The programme shall serve to deepen and enhance the students' specialist knowledge and shall help them to acquire management skills in the focal area of the integrative protection of the environment and natural resources.

(4) Graduates shall be enabled to assess technological, socioeconomic, and ecosystem-related processes and to design these with the objective of a sustainable use of natural resources.

(5) [1]In addition to extending the students' expertise, focus shall be placed on the acquisition of planning skills. [2]These shall include the independent penetration and design of specialist tasks and the definition and structuring of work for the implementation of practical solutions, including in a group. [3]The study project and the Master's thesis are particularly helpful here with their corresponding requirements in a scientific, technical and organisational respect.

(6) In addition to their specialist expertise, the students shall improve their skills in foreign languages, interculturalism, information literacy and teamwork, and individual problem solving.

Section 3 Graduation, degree

(1) The degree of "Master of Science" (MSc) shall be awarded upon successful completion of the study programme.

(2) [1]Within the Master's programme in ERM, there is the option of acquiring a double degree in collaboration with Universidad Tecnologica de Pereira (UTP) in Colombia, whereby a "Magister en Ecotecnologia" at UTP shall be awarded in addition to the "Master of Science" (MSc) at BTU. [2]The study and examination regulations for the double degree programme can be found in Annex 4.

Section 4 Specific admission and enrolment requirements

(1) [1]The basic requirement for admission to the Master's programme is an undergraduate degree (at least a Bachelor's degree) whose teaching contents feature sufficient basic knowledge in the fields of the natural sciences, the environmental sciences, engineering, or socio-economics. [2]The benchmark for the determining whether this requirement is met is sufficient relevant completed modules from a qualified academic degree for the selected discipline;

- Environmental Sciences (e.g. biology, ecology, soil science, climatology, agronomy, forestry, water management, hydrology, geology)
- Environmental Economics, Planning and Law (e.g. environmental economics, environmental law, environmental planning, agricultural economics, operational environmental management, environmental policy, development economics, environmental governance)
- Environmental Engineering (e.g. environmental technology, process and plant technology, processing technology, recycling management, hydraulic engineering, water technology, sewage and irrigation technology, biotechnologies)

and the module contents of the Bachelor's programme in ERM (for all disciplines).

(2) The Degree Programme Co-ordinator shall be responsible for checking that the subject-related requirements are met.

(3) The choice of discipline shall take place at the time of application and can be changed up to the end of the first programme-related semester through an application to the Degree Programme Co-ordinator, provided that the subject-related requirements for the transfer are met.

Section 5 Regular duration of the standard programme, credits for the programme

(1) [1]The regular duration of the standard programme for the Master's programme is four semesters. [2]The Master's programme amounts to 120 credits, whereby one credit corresponds to 30 hours of work. [3]Students can only start the programme in a winter semester.

(2) Individual part-time studies in accordance with Section 6 (3) RahmenO is possible.

Section 6 Structure and form of the programme

(1) [1]The language of teaching/examination shall be English. [2]This is why English language skills are required for the programme in accordance with Section 3 (3) Enrolment Regulations (ImmaO).

(2) [1]The structure of the ERM Master's programme is laid down by the curriculum in Annex 1. [2]It shall include the following disciplines:

- Environmental Sciences,
- Environmental Economics, Planning and Law,
- Environmental Engineering.

(3) The programme shall include the following modules:

- the mandatory module “Study Project” worth 12 credits,
- the mandatory module “Introduction to Environmental and Resource Management II” worth 6 credits,
- compulsory elective modules from Annex 2 worth 72 credits, including modules worth at least 42 credits from the selected discipline,
- the mandatory module “Master Thesis”, including the defence, worth 30 credits.

(4) [1]The range of compulsory elective modules can be adjusted each semester as required by the Degree Programme Co-ordinator in consultation with the examination board and the Faculty Council. [2]The feasibility of studying the modules within the standard programme length must be guaranteed in each case. [3]The administration (Student Information System Management Unit) must be informed by the Degree Programme Co-ordinator of the adjustment of the range of compulsory elective modules one month before the start of the semester.

(5) [1]The students are urgently recommended to create an individual study plan, especially with regard to the appropriate preparation for writing the Master thesis. [2]The students’ mentors shall assist them with this plan.

(6) The study programme shall optionally include a research track, i. e. the formation of a specific research profile from the third semester of the standard programme length aimed at a targeted recruitment of the next generation of academics.

(7) [1]The research track shall comprise:

- the mandatory module “ERM Research Module” worth 18 credits. [2]The contents of the module are specified in the corresponding module description, which shall be regularly adjusted on the basis of current research projects of the chairs involved. [3]The module shall replace subject-related compulsory elective modules worth 18 credits in the respective discipline.
- the mandatory module “Study Project” worth 12 credits in accordance with Section 3, and the Master’s thesis.

[4]For admission to the research track, evidence must be provided of:

- the acquisition of 54 credit points and an average grade of at least 1.3. [5]Decisions about exceptions shall be made by the examination board. [6]Exceptions shall only be possible if the application is supported by at least two professors from Faculty 2 and the average grade is no lower than 1.7.

[7]Applications for admission to the research track can only be made to the Degree Programme Co-ordinator by a professor from Faculty 2. [8]The application should be made by the end of the lecture period of the second programme-related semester. [9]An up-to-date Transcript of Records must be enclosed with the application.

[10]Admission to the research track requires the approval of the examination board. [11]Approval may also be subject to evidence that 54 credits have been obtained by the end of the second programme-related semester.

[12]The Admissions and Registrar’s Office, which undertakes the registration for the module “ERM Research Module”, shall be informed by the Degree Programme Co-ordinator of the students admitted to the research track by the end of the second programme-related semester.

(8) [1]A semester abroad is recommended for acquiring additional subject-related knowledge, especially with regard to the future subject of the Master’s thesis. [2]The third programme-related semester is suitable for this.

Section 7 Special regulations for the organisation of examinations

[1]In accordance with Section 16 (2) Sentence 2 RahmenO-MA, the module “ERM-Research Module” can only be retaken once if it is not passed. [2]In accordance with Section 17 RahmenO-MA, it ranks as a practical part of the study programme and is therefore excluded from the free attempt regulation.

Section 8 Master thesis

(1) [1]The Master thesis module shall be worth 30 credits. [2]The Master’s thesis shall be composed in English and shall generally be written in the fourth semester. [3]The time allowed to produce the written thesis is five months.

(2) [1]Anyone who has obtained at least 72 credits at the time of registration shall be admitted to the Master thesis module. [2]The obtained credits must include the successful completion

of the mandatory module “Introduction to Environmental and Resource Management II” and of the study project.

Section 9 Additional regulations

(1) [1]Up to 30 credits’ worth of compulsory elective modules can be replaced by complementary modules in terms of Section 26 RahmenO-MA. [2]The complementary modules do not necessarily have to be worth six credits and can be offered in the respective national language. [3]The following can be accredited as complementary modules:

- modules offered by guest lecturers and guest professors,
- modules from other study programmes at BTU,
- modules from partner institutions,
- modules from other universities that are completed during a stay abroad.

[4]Modules from PhD programmes and graduate schools cannot be accredited as complementary modules. [5]Language courses cannot be used to replace compulsory elective modules in terms of Section 26 RahmenO-MA.

(2) Applications for approval for complementary modules that are studied at BTU shall be made to the examination board via the Degree Programme Co-ordinator.

(3) [1]Complementary modules that are studied during a semester abroad shall not go towards the overall grade. [2]They shall be shown separately in the Transcript of Records.

Section 10 Commencement, interim regulations, abrogation

(1) These regulations shall come into force in 2021.

(2) [1]These Examination and Study Regulations shall apply to all students on the Master’s programme in ERM who commence their studies from the winter semester of 2021/22.

[2]It is possible for students who have already enrolled in the Master’s programme in ERM to transfer to these Examination and Study Regulations upon application.

(3) These Examination and Study Regulations shall cease to apply once the standard programme length plus four semesters has passed following the enrolment of the final student.

Issued on the basis of the resolutions of the Faculty Council of Faculty 2 – Environment and Natural Sciences of 04 March 2020 and 02 June 2021, the statement of the Senate of 13 February 2020 and the approval from the President of Brandenburg University of Technology Cottbus-Senftenberg of 24 June 2020.

Cottbus, 07. June 2021

Professor Gesine Grande
President

Annex 1: Programme structure and modules for the Master's programme in ERM

Module type	Performance verification/study performance	Semester				Credits
		1	2	3	4	
Mandatory modules						
(41421) Introduction to ERM II	Performance verification	6 credits				18
(41514) Study Project	Performance verification			12 credits		
Subject-related modules in the discipline of "Environmental Sciences"						
Compulsory elective modules*	7 modules from Tab. 3A	**X**				72
Subject-related modules in the discipline of "Environmental Economics, Planning and Law"						
Compulsory elective modules*	7 modules from Tab. 3B	**X**				72
Subject-related modules in the discipline of "Environmental Engineering"						
Compulsory elective modules*	7 modules from Tab. 3C	**X**				72
and						
(11243) Master's Thesis					**X**	30
Total						**120**

* Up to 30 credits can be replaced by complementary modules in accordance with Section 9.

Annex 2: Catalogue of compulsory elective modules (Own, current listing)

The catalogue of compulsory elective modules can be adapted in accordance with Section 6 (4).

Table 3A: Subject-related modules in the discipline of "Environmental Sciences"

Module No.	Module title	Credits
12759	Multifunctional Landuse	6
13298	Basics for Freshwater Management	6
41406	Environmental Modelling	6
42505	Freshwater Restoration Ecology	6
41217	General and Applied Ecology	6
12826	Mathematical Data Science	6
12261	Ecological Excursion	6
12949	Geoecology	6
12959	Geopedology	6
12942	Introduction to Climate Variability and Climate Change Projections	6
13221	Land surface - Atmosphere Interactions	6
13046	Microclimates	6
41111	Parasites	6
41210	Philosophy of Ecological Sciences	6
13300	Environmental Data Science	6
13653	Atmospheric Water	6
13663	Environmental Soil Science and Plant Nutrition	6
13580	Systems and Process Hydrology	6
13657	How to talk about nature?	6

Table 3B: Subject-related modules in the discipline of "Environmental Economics, Planning and Law"

Module No.	Module title	Credits
13657	How to talk about nature?	6
11284	Advanced Studies of International Environmental Law	6
12983	Climate Change and Migration	6
41405	Cost-Benefit Analysis in Environmental Evaluation	6
11693	Ecological-Economic Modelling for Biodiversity Conservation	6
41427	Economics of Land Use and Biodiversity Conservation	6
41422	Measuring Sustainability	6
42417	Methods of Water Resources Management	6
43406	Municipal Solid Waste Management	6
12032	Statistics for Economic Analysis of Ecosystem Service Provision and Biodiversity Conservation	6
41404	Strategic Environmental Assessment and Environmental Impact Assessment	6
11463	Urban and Regional Planning	6
12971	Operations Research for Environmental and Resource Management	6
13236	Empirical Methods in Social Science Research and their Application to the Analysis of Environmental Issues in the Global South	6

Table 3C: Subject-related modules in the discipline of "Environmental Engineering"

Module No.	Module title	Credits
13517	How to talk about nature?	6
13169	CFD Seminar	6
11510	Gas Cleaning	6
11229	Hydrology & Hydraulics	6

11228	Information Management in Hydroinformatics Systems	6
42421	Modelling Process in Hydroengineering Projects	6
11225	Natural Resource Investigation	6
35303	Numerical Simulation: Free Surface and Groundwater Modelling	6
12165	Power System Economics I	6
44107	Renewable Energy Technologies for Power Supply	6
44419	Safety- and Risk-Analysis for Process Plants	6
13515	Wastewater and Sludge Treatment	6
12989	Advanced Methods in Process, Energy and Systems Engineering	6
13655	Process System Technology II	6
13664	Un/disciplining Knowledge: Technology, Science, and Society in Transformation	6
13517	Soil Reclamation and Landscape Restoration	6

Annex 3: Standard programme plan for a Master's programme in ERM

(The named modules exemplify a possible standard programme plan for the subject-related discipline "Environmental Sciences")

<table>
<tr><th>1st Semester</th><th>2nd Semester</th><th>3rd Semester</th><th>4th Semester</th></tr>
<tr><td>M1 (41421)
Introduction to Environmental and Resource Management II</td><td>ES5 (41406)
Environmental Modelling</td><td>Compulsory elective modules from Table 3B</td><td rowspan="5">(11243)
Master's Thesis</td></tr>
<tr><td>ES1 (41217)
General and Applied Ecology</td><td>ES4 (42505)
Freshwater Restoration Ecology</td><td>Compulsory elective modules from Table 3B</td></tr>
<tr><td>ES2 (New)
Geoecology and Geopedology</td><td>ES6 (New)
Environmental Soil Science and Plant Nutrition</td><td rowspan="2">M2 (41514)
Study Project</td></tr>
<tr><td>ES3 (New)
Basics for Freshwater Management</td><td>ES8 (New)
Systems and Process Hydrology</td></tr>
<tr><td>ES7 (New)
Geopedology Field Course</td><td>ES9 (12971)
Operations Research for Environmental and Resource Management</td><td>Compulsory elective modules from Table 3C</td></tr>
<tr><td>30 credits</td><td>30 credits</td><td>30 credits</td><td>30 credits</td></tr>
</table>

Annex 4: Regulations for a double degree with the Universidad Tecnologica de Pereira in Colombia

1. Scope of validity

(1) The integrated German-Colombian double degree at Brandenburg University of Technology Cottbus–Senftenberg (BTU) in collaboration with Universidad Tecnologica de Pereira in Colombia (UTP) shall be implemented in accordance with the applicable national laws and regulations.

(2) The latest version of the General Examination and Study Regulations for Master's Programmes and of the Subject-Related Regulations for the Master's Programme in Environmental and Resource Management shall apply to the study programme.

2. Content profile of the double degree, programme goals

(1) The double degree programme integrates the two Master's programmes Environmental and Resource Management at BTU and Ecotecnologia (Ecotechnology) at UTP.

(2) [1]The study visit to the country of the partner university shall improve the graduates' professional prospects and make it possible for them to gain some international experience. [2]For the students of both universities, participation in the double degree programme shall open up the possibility of gaining a deeper knowledge of the challenges of environmental protection policy and the sustainable use of environmental resources under the specific geographic, economical, and technological conditions of the partner country. [3]The programme shall also make an important contribution to the acquisition of intercultural and communication skills.

3. Graduation, degrees

(1) If the double degree programme is successfully completed, two degrees shall be awarded: "Master of Science (MSc)" at BTU and "Magister en Ecotecnologia" at UTP.

(2) Each university shall be responsible for drawing up its own Master's certificate and degree documents.

(3) The certificate and the degree documents shall be issued by each university in accordance with the respective national regulations.

(4) In order to obtain the double degree, the students must be enrolled to complete the study programme at the home university and at the host university.

4. Further admission and enrolment requirements

(1) [1]Students from both universities can generally apply to the Degree Programme Co-ordinator for admission to the double degree programme until the end of the first semester of their Master's programme in Environmental and Resource Management (BTU) or Ecotecnologia (Ecotechnology) (UTP). [2]The Degree Programme Co-ordinator shall check whether the conditions for admission to the double degree programme are likely to be met by the end of the second semester. [3]In addition to the necessary language skills in accordance with (3) and (4), previous study performances and the motivation of the students shall be taken into account on the basis of a motivation letter and selection interviews. [4]The Degree Programme Co-ordinator shall inform the administrative bodies that are responsible for enrolment at both universities of the selected candidates.

(2) [1]During their stay at the partner university, the students are enrolled at both universities, but have been granted a leave of absence from the home university and are subject to the laws applicable at the partner university. [2]At BTU, the students shall be enrolled in the Master's programme in Environmental and Resource Management, at UTP in the Master's programme in Ecotecnologia (Ecotechnology).

(3) By the start of the mobility period at UTP, students whose home university is BTU are required to provide evidence of Spanish skills at a level of A2 according to the Common European Framework of Reference (CEFR).

(4) For students whose home university is UTP, evidence of their English skills in accordance with Section 6 (1) is required for enrolment at BTU at the latest.

5. Structure and form of the programme

(1) [1]The students from both universities shall carry out their studies in accordance with the regulations of their home university for the

Master programmes in Environmental and Resource Management (BTU) or Ecotecnologia (Ecotechnology) (UTP). [2]This notwithstanding, some of the study performances shall take place at the partner university.

(2) The part of the programme to be completed at the partner university, by students of both BTU and UTP, shall encompass at least one semester within the standard programme length with mandatory or compulsory elective modules worth at least 30 ECTS credits.

(3) [1]Students whose home university is BTU shall generally study at BTU for the first two semesters and at UTP for the third and, where appropriate, the fourth semester. [2]UTP students shall complete their third and, where applicable, their fourth semester at BTU.

(4) [1]For BTU students who study at UTP as part of the double degree programme, the UTP modules offered can be found in the list of compulsory elective modules in Annex 1. [2]The compulsory elective modules that are required for their chosen discipline, amounting to 42 credits, must be completed at BTU in accordance with Section 6 (3).

(5) For UTP students who study at BTU as part of the double degree programme, the modules offered can be found in the list of compulsory elective modules in Annex 2.

(6) [1]Students in the double degree programme are obligated to consult the degree programme co-ordinators of both their home university and the partner university before selecting the seminars at the partner university. [2]The degree programme co-ordinator shall make a record of the consultation. [3]The selection of seminars must be presented in a study plan and must be approved by the examination boards of both universities. [4]The study plan must be submitted to the Admissions and Registrar's Office.

(7) [1]The language of teaching/examination at BTU shall be English. [2]The languages of teaching/examination at UTP shall be English or Spanish depending on the teaching language specified in the module overview in Annex 1.

(8) [1]BTU students who achieve less than 30 ECT credits during their studies at UTP can apply to the examination board of the Master's programme in Environmental and Resource Management at BTU for their performance to be accredited as complementary modules for the Master's programme in Environmental and Resource Management in accordance with Section 9. [2]It shall not be possible to obtain the double degree with less than 30 ECTS credits from the studies at UTP. [3]Correspondingly, UTP students must provide evidence of at least 30 ECTS credits from their studies at BTU in order to obtain the double degree.

6. Master's thesis

(1) The provisions of Section 8 shall apply for the Master's thesis, with the exception of Section 8 (2) Sentence 2, which shall not apply to students whose home university is UTP.

(2) [1]The Master's thesis can be written either at the home university or at the partner university. [2]Registration for the Master's thesis shall take place at both universities. [3]One lecturer from BTU and one lecturer from UTP shall supervise the Master's thesis together.

(3) [1]The Master's thesis must be written in English with an additional translation of the title into Spanish and German. [2]A summary in Spanish must be appended.

(4) The thesis shall be graded by the two supervisors in English in separate reports.

(5) [1]An integral part of the Master's shall be a conclusive defence of the thesis at one of the two universities, with the participation of both the supervisors. [2]The defence may be conducted in a video conference between BTU and UTP.

(6) For further details, the examination and study regulations of the students' home university shall be decisive.

7. Transfer of study performances

(1) The credits gained at UTP by students whose home university is BTU shall be multiplied by two for conversion into ECTS credits.

(2) The tables in Annex 2 shall be decisive for the conversion of grades.

Annex 1: List of the compulsory elective modules for the Master's programme Eco-tecnologia (Ecotechnology) at UTP from which BTU students can choose in the context of the double degree programme

This list of compulsory elective modules can be adjusted in accordance with Section 6 (4).

Module No.	Module title	Teaching language	Credits at UTP *
702A3	Waste management / Aprovechamiento de residuos	Span.	3
702B3	Water supply and treatment systems / Sistema de abasto y remoción de aguas	Span.	3
702C3	Strategies of rural planning / Estrategias de planificación rural	Span.	3
702D3	Agroecology / Agroecología	Span.	3
70205	Technologies of environmental processes / Tecnologías de procesos ambientales	Engl.	3
702F3	Ecological agriculture / Manejo ecológico de agrosistemas	Engl.	3
703A3	Energy and environment / Energía y medio ambiente	Span.	3
703A13	Geosciences / Geociencias	Span.	3
703A23	Complex adaptive systems / Sistemas complejos adaptativos	Span.	3
703A33	Geographic information systems / Sistemas de información geográfica	Span.	3
703B3	Regenerative energies / Energias renovables	Span.	3
703C3	Ecological soil restoration / Restauración ecológica de suelos	Engl.	3
703D3	Natural systems for sewage treatment / Sistemas naturales de tratamiento de aguas residuales	Engl.	3
703E5	Phytoremediation / Fitorremediación	Engl.	3
703F3	Biotechnology in agricultural production / Biotecnología en la producción agricola	Span.	3
703G3	In-vitro plant production / Producción de vitroplantas	Span.	3
703H3	Technology selection / Selección de tecnologías	Engl.	3
703I3	Social impacts of projects / Impacto social de proyectos	Span.	3
703J3	Environmental management systems / Sistemas de gestión ambiental	Span.	3
703K3	Simulations / Simulación	Engl.	3
703L3	Natural systems for of solid and liquid waste treatment / Sistemas naturales para el manejo de residuos solidos y liquidos	Engl.	3
703M3	Agricultural production / Produccion agricola	Span.	3
703N3	Water demand management / Gestion de la demanda del agua	Span.	3
703O3	Ecological restoration / Restauración ecológica	Span.	3
703P3	Design and evaluation of agroforest systems / Diseño y evaluacion de sistemas agroforestales	Engl.	3
703Q3	Simulation of natural systems / Simulacion de sistemas naturales	Engl.	3
703R3	Analysis of life cycles / Analisis del ciclo de vida	Engl.	3
703S3	Emergy analysis / Emergy análisis	Engl.	3
703V3	Biotechnology / Biotecnología	Span.	3

Module No.	Module title	Teaching language	Credits at UTP *
703X3	Chemical ecology / Ecología química	Span.	3
	Hydroclimatology of the tropics / Hidroclimatologia de los tropicos	Engl.	3
	Environmental history / Historia ambiental	Engl.	
	Ecotoxicology / Ecotoxicologia	Engl.	3
	Study project / Trabajo cientifico	Engl.	6

* 3 UTP credits correspond to 6 ECTS credits.
Engl.: English Span.: Spanish.

Annex 2: Conversion of grades

BTU → UTP	
BTU examination grade	**UTP examination grade**
1.0	5.0
1.3	5.0
1.7	4.5
2.0	4.5
2.3	4.0
2.7	4.0
3.0	3.5
3.3	3.5
3.7	3.0
4.0	3.0
5.0	< 3.0

UTP → BTU	
UTP examination grades	**BTU examination grades**
5.0	1.0
4.5	1.7
4.0	2.3
3.5	3.0
3.0	3.7
< 3.0	5.0