ASIIN Seal & Eur Ace Label

Accreditation Report

Bachelor's Degree Programme
Geodesy

Provided by
Mongolian University of Science and Technology

Version: 23.03.2018

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Ba Геодези	Bachelor of Engineering in Geodesy	ASIIN, EUR-ACE® Label	--	TC 03
Date of the contract: 19 December 2013 **Submission of the final version of the self-assessment report:** 25 May 2016 **Date of the onsite visit:** 26-27 September 2016 **at: Ulaan Baator**				
Peer panel: Dipl.-Ing. Heinrich Brueggeman, Surveying Office North Rhine Westfalia; Prof. Dr. Joerg Hauptmann, University of Applied Sciences Biberach; Prof. Dr. Wolfgang Reinhardt, University of the Bundeswehr (Munich)				
Representative of the ASIIN headquarter: Dr. Michael Meyer				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2014				

[1] ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes;

[2] TC: Technical Committee for the following subject areas: TC 01 – Mechanical Engineering/Process Engineering; TC 02 – Electrical Engineering/Information Technology); TC 03 – Civil Engineering, Surveying and Architecture; TC 04 – Informatics/Computer Science); TC 05 – Physical Technologies, Materials and Processes); TC 06 – Industrial Engineering; TC 07 – Business Informatics/Information Systems; TC 08 – Agronomy, Nutritional Sciences and Landscape Architecture; TC 09 – Chemistry; TC 10 – Life Sciences; TC 11 – Geosciences; TC 12 – Mathematics; TC 13 – Physics.

Subject-Specific Criteria of Technical Committee 03 – Civil Engineering and Geodesy of 09.12.2011	

B Characteristics of the Degree Programme

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Ba Геодези	Bachelor of Engineering In Geodesy		Level 6	Full time	--	8 Semester	240 ECTS	Fall Semester 01.01.1980

For the Bachelor's degree programme Geodesy the institution has presented the following profile in the self-assessment report:

Professional knowledge and abilities:

Students should have

- knowledge of basic concepts and methods of mathematical analysis, algebra and geometry concepts, theories and methods of probability theory and mathematical statistics, the most important definitions, the wording of theorems, basic formulas, the fundamental laws and theories of classical and modern physics, as well as methods of physical research, as the basis of professional activities, theory of mathematical processing of geodetic measurements;
- knowledge of the basic concepts of geodesy, methods and geodetic instrument for geodetic measurements, the theory of observation errors of measurements, general information about creation of geodetic networks, types of surveying, methods and means of engineering geodesy and survey works; the principles of work, types and systems of coordinates of navigation satellite systems, a technology with use of navigation satellite systems, the main stages of processing of satellite measurements and the software;
- the ability to solve technical problems on a map, perform calibration and adjustment of geodetic instruments, to conduct engineering surveys; independently per-

[3] EQF = The European Qualifications Framework for lifelong learning

form geodetic measurements on the terrain; processing results of geodetic measurements; the type and work with various satellite equipment, the processing of satellite measurements

- the ability to work with geodetic instruments, systems and technologies; with specialized software products in the field of geodesy; reading ability of topographic maps and plans, and the main methods of their preparation; methods of engineering surveys; methods of satellite observations and their processing; means and methods of surveying and global positioning
- the knowledge of basic theory of photogrammetry and remote sensing, the basic methods and systems used for photogrammetric processing of images; principles of design and operation of remote sensing survey; methods and technologies of performance aerospace surveys; the basic elements of the structure of geographic information systems, database technologies in geographic information systems;
- the ability to use aerial photographs and remote sensing techniques, to substantiate optimal variants for creating and updating topographic maps and plans and other problems by photogrammetric methods; perform the complex designing of works on ground photogrammetric survey, to design an information system using GIS technology;
- the knowledge of theory of cartography and mathematical cartography, methods of drawing up, editing, preparation for the edition and editions of topographic, thematic maps and atlases in traditional analog and digital forms, the main cartographical projections, their properties and application; bases of the theory of distortions;
- the ability to create thematic maps, atlases and other cartographic products with geographic information and publishing technologies; design and develop computer design different maps; edit cartographic works at all stages of creation; calculate and build a grid projection using modern technical means;
- knowledge in the field of theoretical and practical cartography, definition of projections of the published maps; by methods and in the ways of a choice of cartographical projections, basis of a different type of maps;
- Knowledge of the general theory of land management, land use organization of the territory; regulations on the organization of land use and protection; forecasting, planning and design of land use, management and protection of land; cadastral valuation and registration of real estate; land monitoring;
- the ability to carry bends and land surveying; to issue land management in accordance with the requirements for land use documentation.
- the ability to draft land management schemes, their economic justification; demarcation of agricultural and non-agricultural land use designation; work with land

management documentation; possession of land management and cadastral terminology.
- knowledge of computer application in geodetic work; the formation of geographic information systems;
- the ability to process the results of geodetic measurements with the use of modern computer technology; to use the results for the social activity, in the cognitive and professional activity of computer skills, use geoinformation and telecommunication technology for creation of maps, software products in the cartography, geoinformatics and processing of space imagery;
- knowledge of methods to create and design plans and maps using modern computer technology

Social competences:

Students should have

- knowledge of a state language, one foreign language for granting and documenting of information
- the ability to state in writing or orally the ideas and options of a solution
- knowledge of elements of spiritual, esthetic and ethical culture as well as knowledge of legal and moral ethical standards in the sphere of professional activity
- knowledge to form a healthy lifestyle

Economic, organizational and administrative competences

Students should have

Knowledge of the rules and regulations of labor protection, safety, industrial hygiene and fire protection in geodesic work, safety during surveying; safety measures when carrying out geodetic works;

Fundamental knowledge of the economy, scientific organization of labor, regulation, organization of production and management; the basics of management and marketing;

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Self-assessment report
- Website of the faculty
- Discussions with representatives of the university

Preliminary assessment and analysis of the peers:
The University defined study aims and intended learning outcomes of the Bachelor Programme at a level of higher education which corresponds to learning outcomes relevant to level 6 of the European Qualifications Framework. Learning outcomes are accessible to students, staff members, and all the other stakeholders on the faculty web site. Those objectives were discussed in academic staff meetings with the faculty team, alumni, professional societies, industry, and government/public agencies. The panel welcomed the transparent way to public the objectives and the intention of the faculty to get a permanent feedback from representatives of the labor market.

The peers found the areas of competence as set forth by the Subject-Specific Criteria in Survey to be largely met by the programme. Regarding the underlying bases the students shall have knowledge and understanding in the fields of mathematics and physics and thorough knowledge of subject-specific fundamentals of surveying and geo-informatics like photogrammetry and remote sensing, adjustment, cartography, computer science, geographic information systems (GIS) and spatial data infrastructure. Students should have applied their skills in the fields of land management, land surveying, cadastre, information systems for geodata and by updating topographic maps and plans by photogrammetric

[4] This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

methods. Students should also know technical handbooks, periodicals and information systems for purposes of availability and verification of current measurement and evaluation procedures and for data collection as well as they should be able to analyze and understand typical survey tasks and GIS requirements. Additionally students should have at least basic knowledge of economic fundamentals, scientific work and project management.

Regarding personal skills of the students the university emphasised their ability to communicate in foreign languages and their ability to be aware of their actions relating ethical and social responsibility and to understand ethical principles and standards.

With these objectives from the view of the peers graduates get a bride profile of the different fields of survey. They learned that round about 30 geodesists are needed by governmental institutions. Additional 200 private companies are employing some 1600 geodesists. Hence the panel saw sufficient need of the labor market for the 20 graduates who are finishing the programme per year (25 students started the programme each year). Nevertheless they are astonished that the fields of construction survey and urban development are not mentioned in the objectives while cadastre should be part of the programme although the faculty offered a separate bachelor's degree programme in cadastre. Therefore the peers are uncertain about the professional qualification of the graduates comparing to the other bachelor programmes in cadastre, mine surveying and GIS. From their point of view it is necessary to draft the educational objectives/learning outcomes in a way that they describe also the professional classification of the qualifications gained in the degree programme.

Criterion 1.2 Name of the degree programme

Evidence:

- The name of the study programme is published in the specific regulation on the webpage.

Preliminary assessment and analysis of the peers:
The title of the programme is published on the subject specific website. The information about the programme is published in Mongolian language. The study programme is primarily carried out in Mongolian language.

The peers determined that in most countries geodesy is the generic term for land surveying, mine surveying, GIS and Cadastre. From sight of the peers the content and the objectives of the programme are focussed on surveying, so for the European understanding the title suggest a bride of content which is not fulfilled in the programme. On the other side the panel considered the Russian tradition with another meaning of the term. Therefore the peers accepted the title of the programme.

Criterion 1.3 Curriculum

Evidence:

- The study regulations define the curriculum and the single modules.
- The module descriptions inform about the aims and content of the single modules.
- Objective-Matrice provided in the Self-Assessment Report
- Discussions with representatives of MUST management, programme coordinators, lecturers, business representatives, students

Preliminary assessment and analysis of the peers:

The curriculum is structured into basic courses in general education, basic specialised courses and specialised courses. Each category contains mandatory and elective courses. During the general education the fundamentals of mathematics, geometry, physics and chemistry are taught supplemented by basics of information technology and economic theory and an introduction to geodesy. Additional the general education courses contain an English language module, a module about Mongolian History and a module to train scientific writing. As elective courses in the general education several modules about sociology, philosophy, political sciences are offered as well as another module about information technology and environment protection.

During the basic specialised courses students learn the fundamentals of geodesy and surveying instruments, geodetic measurements processing, gedodetic networks, cartography, digital mapping and land use planning. Additional they deepened their mathematical knowledge regarding probability and statistics and mathematical methods about processing of geodetic measurements. Also modules about technical English are required. As elective courses students may choose aspects of land and urban cadastre, numerical methods, programming languages, land management or geodetic astronomy, soil studies and Mongolian geography.

As mandatory specialised courses the university offers modules about mathematical cartography, higher geodesy, photogrammetry, GIS, space geodes, gravimetry, GNSS measurement processing, remote sensing and applied geodesy complemented by an module about professional English language. The selective courses contains the fields of land monitoring, administration, valuation, management and planning as well as urban surveying and spatial data programming. Additionally there are offered some non technical courses about English language, academic speaking and industrial organisation in geodesy and cartography.

The panel assessed that the curriculum is defined very traditional. From their point of view it generally meets the requirements set in the ASIIN field specific criteria for geodesy and allows the students to achieve the intended learning outcomes.

In detailed the peers understood that data bases and programming languages are integrated in several modules were these themes are handled basically. More deepened these fields are handled in elective courses. The peers observed that for the handling of geodata knowledge of data bases and for the ability of programming it would be needful for all students and they recommended that both aspects should be dealt in separate mandatory courses due to didactical reasons.

Further on the peers could follow the wish of the students to get more opportunities to train their English language skills especially regarding technical English. Keeping in mind the aim of further internationalisation it would be quite helpful to offer more courses in English.

As mentioned already the curriculum is defined quite traditional and modern applications like laser scanning are not involved so far. The peers understood that laser scanning is nearly not in use in Mongolia because there exist only few laser scanners all over the country. On the other side universities should be on the very front regarding the adoption of modern technique not only for research but also for the preparation of graduates to use modern equipment and get familiar with corresponding methodologies. They recommended to involve the field of laser scanning including processing of point clouds into the curriculum.

Criterion 1.4 Admission requirements

Evidence:

- Joint Self-Assessment Report,
- Student admission and entry requirement of MUST undergraduate degree program, which are approved by Resolution No. 79 of Minister of Science and Education on Mar 18, 2013

Preliminary assessment and analysis of the peers:
The peers were explained that admission to the undergraduate programmes of MUST was conducted centrally by the MUST. Students are admitted based on the results of the General Test organized by an independent body authorized by a governmental institution. Only with top results in the general test applicants are allowed to enter programmes of engineering or natural sciences at MUST. After passing the general test applicants have to absolve specialised tests organised by the faculty to prove their qualification for special programmes.

The auditors confirmed that the requirements and procedures for admission are transparent and clear. All applicants are treated according to the same standards and regulations. According to the peers, especially the faculty-specific test supported the students in achieving the learning outcomes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

The university gave only some editorial notes in its comment. Therefore the peers confirmed their former assessment in general. They assessed the criterion as partly fulfilled and suggested a requirement to draft the educational objectives/learning outcomes in a way that they describe also the professional classification of the qualifications gained in the degree programme. Further on the suggested recommendations to give students the opportunity to get knowledge about modern techniques like laser scanning and with a view to internationalisation to enhance English language skills of the students. Additionally they suggested to recommended that data bases and programming languages are dealt in separate courses for all students due to didactical reasons.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Student's Guide
- Module descriptions
- Law on Higher Education (Law on Higher Education, Aticle 3 and Aticle 8.7, approved May 3, 2006

Preliminary assessment and analysis of the peers:

The peers assessed that the degree programme is divided into modules and its structure is clearly outlined on the subject specific website. Each module is a sum of teaching and learning whose contents are concerted. With its choice of modules, the structure ensures that the learning outcomes can be reached. Based on the analysis of the sequence of modules and the respective module descriptions the peers concluded that the structure of the degree programme ensures that the learning outcomes can be reached. The programme also offers a number of elective courses which allows the students to define an individual focus.

But the peers marked that it is not clear for all courses how the module objectives helps to reach both the qualification level and the overall intended learning outcomes. Because in some cases the module objectives are not described in an outcome oriented way their relation to the aims of the study programme is uncertain. Here the peers saw the need of a revision of the module descriptions.

The module structure with its elective courses allows students to absolve studies abroad without any structural conditioned loss of time. To facilitate the mobility of the students the university has defined rules for the recognition of credits acquired at other higher education institutions. Prerequisite for the recognition is an accreditation of the foreign programmes. As an additional support of the mobility of the students the university has signed cooperation contracts with several universities in Japan, Korea, Taiwan and USA.

Criterion 2.2 Work load and credits

Evidence:

- Self Assessment Report
- Module descriptions:
- Student Guide Handbook
- Discussions with representatives of MUST management, programme coordinators, lecturers, business representatives, students

Preliminary assessment and analysis of the peers:
The peers understood that MUST uses on the one side a Mongolian national credit point system based on contact hours and on the other side ECTS credit point based on the student workload. The university defined he curriculum with 30 ECTS points per semester on average and 30 hours of student workload per ECTS point.

The peers noticed that in the module descriptions the named hours for lectors and self study do not correspond to the given ECTS Point. They learned that the category “self study” in the description means only the time students learn supervised by lectures und do not include the time students learn by themselves. The panel found it necessary to add the complete time of self study to the workload definition and to make it transparent to students and other stakeholders.

Considering the named ECTS points for the single modules the peers assessed the estimated time budgets as realistic to enable students to complete the degree without exceeding the regular course duration. Structure-related peaks in the workload have been avoided by the university.

Criterion 2.3 Teaching methodology

Evidence:

- Self Assessment Report
- Module descriptions:
- Discussions with representatives of MUST management, programme coordinators, lecturers, business representatives, students

Preliminary assessment and analysis of the peers:
The programme under review is a full-time programme with classroom, structured, and self-study activities. The staff members apply various teaching and learning methods (such as lectures, computer training and classroom and lab exercises, field practice, individual and group assignments, seminars and projects). Structured activities include tutorial, homework, assignment and practical activities. Group project assignments are also given in some courses to develop students' skill in teamwork, discussion, and coordination. Also the field practice is done as group work. The peers concluded also with reference to the remarks of the students that the teaching methods and instruments used supported the students in achieving the learning outcomes. The degree programme is well-balanced between attendance-based learning and self-study and students become familiar with academic writing methods.

Criterion 2.4 Support and assistance

Evidence:

- Self Assessment Report
- Discussions with representatives of MUST management, programme coordinators, lecturers, business representatives, students

Preliminary assessment and analysis of the peers:
The peers welcomed the concept of an academic advisor. Each year of students has a special lecturer as advisor in field specific questions and as well as for administration problems. Each advisor supports 25 Students. Usually, the academic advisor is available for any consultation a student may need, even for problems beyond academic matters. The students confirm that the academic advisors normally try to be very supportive to students. Additionally there are several centralized institutions at MUST for the general support of students. The peers underlined that the allocated advice and guidance, namely the academic advisor assisted the students in achieving the learning outcomes and in completing the course within the scheduled time.

Besides this comprehensive advisory system the peers noticed some difficulties regarding the mobility of students. In case students want to go abroad they reported about financial problems to realise a study abroad. Additionally the students reported that the institutional

advisory system for international affairs does not work very well and that they are dependent on the personal support of single professors. In spite of these difficulties some 15% of the students absolve a semester abroad. Nevertheless the peers recommended to improve the (financial) opportunities for students to complete a period of vocational practice or a stay at a different higher education institution abroad.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

The university resigned on any comment to this criterion. Hence the peers confirmed their former assessment. They saw the criterion partly fulfilled and suggested requirements about the module descriptions and about the conversion of Kazakh credit points into ECTS points. Further on they suggested a recommendation to improve the opportunities for students to realize a stay at a university abroad.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self Assessment Report
- Module descriptions:
- Discussions with representatives of MUST management, programme coordinators, lecturers, students

Preliminary assessment and analysis of the peers:

The peers determined that the exams are devised to individually measure to which extent students have reached the learning outcomes defined. They are structured to cover the intended learning outcomes and are module-related and offer students continuous feedback on their progress in developing competences. For each module, a form of assessment (including suitable alternatives, if any) has been defined.

The number and distribution of the exams ensure that both the exam load and preparation times are adequate. All exams are organised in a way which avoids delays to student progression caused by deadlines, exam correction times, re-sits etc. All exams are marked using transparent criteria. There are mechanisms in place which ensure that exams marked by different examiners are comparable. Failed exams can be repeated as often as students like to do but they have to pay credit fees for the repetition.

Regarding the final thesis the peers learned that only students with a grade average better than 2,5 are allowed to write a thesis. All other students only absolve a final exam and are not allowed to enter master degree programmes. From the view of the peers an academic study programme has to ensure that students are able to work on a set task independently and at the level aimed for. To assess this competence of students it seems to be necessary that all students if not do a thesis at least have to absolve a final project or something similar. An academic grade without any experiences in academic writing seems not to be adequate to a bachelor degree.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

The university resigned on any comment to this criterion. Hence the peers confirmed their former assessment. They saw the criterion widely fulfilled but suggested a requirement to ensure that students finishing with a exam have to work problem oriented and independently on a project during their study.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self Assessment Report
- Staff handbook
- Discussions with representatives of MUST management, programme coordinators, lecturers

Preliminary assessment and analysis of the peers:

In general the peers noticed that the composition, scientific orientation and qualification of the teaching staff team are suitable for sustaining the degree. There were 16 lecturers involved in the programme and 2 non academic staff members.

Considering the other programmes of the faculty the quantity of the staff seems to be still sufficient to offer all programmes in the foreseen quality. But the peers determined at the same time that only two technicians were included for the field of geodesy. From their side of view this technical support for the professors seems to be very small regarding to laboratory practice of the students and research activities of the professors. Because of the quantity of staff members and their teaching workload there is not much time for research activities of single lecturers. In spite of these difficulties the staff acted in several research

projects with industry especially in the field of geothermal energy. Due to the financial situation there only is few research cooperation with other universities in geodesy. All in all the peers found research activities which are adequate for the actual circumstances but which should be improved with regard to the more scientific orientation of the university. Therefore they recommended that measures should be taken to improve the research performance of the Department of Geodesy.

Criterion 4.2 Staff development

Evidence:

- Self Assessment Report
- Discussions with representatives of MUST management, programme coordinators, lecturers

Preliminary assessment and analysis of the peers:
The university explained that there were several concepts to enhance the didactical competences of staff members. Especially new staff members were required to take short courses in teaching methodology. MUST supported academic staff members who hold a master's Degree to continue their study to doctorate level. Faculty members were encouraged to present their research papers in both national and international conferences, and to collaborate with colleagues from leading foreign universities. Hence, the peers could see that MUST offered opportunities to staff members to further develop their professional and teaching skills. Sabbaticals are possible for the lecturers with a funding from government for 3 month and there were financial support for visiting congresses as well.

Criterion 4.3 Funds and equipment

Evidence:

- Self Assessment Report
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

Preliminary assessment and analysis of the peers:
The peers were explained that financial sources for MUST originated from tuition fees, government funding and society funding. The report provided an overview of the "operational budget" and the "research grants" for the Faculty. The operational funds were distributed to the Faculties and Schools of MUST based on a specific formula depending on the number of students.

The peers were convinced that the financial sources were sufficient and secured for the timeframe of the accreditation.

The financing of the equipment is ensured mostly by external funds (third party money). The peers saw well equipped laboratories but the actual standard is improving only slowly. Therefore the peers noticed room for modernisation of the existing equipment but also for the purchase of complete new hardware like laser scanning which would help to support research activities of the professors and would lift the complete programme to a more modern level (see chapter 1.3).

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

The university resigned on any comment to this criterion. Hence the peers confirmed their former assessment. They saw the criterion generally fulfilled but suggest a recommendation that measures should be taken to improve the research capacity of the Department of Geodesy.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions:

Preliminary assessment and analysis of the peers:
The peers positively noted that the full set of modules descriptions is published for the degree programme under review. Hence, the module descriptions are available for all interested stakeholders. The peers examined the module descriptions and noted that the modules have comprehensible names and identification codes, that responsible persons are named, the teaching methods are specified and the workload is defined in connection with the credit points for each module. Additionally the content of the modules are described, their admission and examination requirements as well as the forms of assessments. Finally recommended literature is listed in the descriptions.

But as mentioned before (see chapter 2.1) the objectives of some of the modules are not quite clear because there are missing learning outcomes in some cases. Here the peers saw the need of a revision of the module descriptions.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Certificate of study programme is missing

- Transcript of Records of study programme is missing
- Diploma Supplement is missing

Preliminary assessment and analysis of the peers:
After graduation a certificate in Russian and English language is issued together with a Transcript of Records. But there is no Diploma Supplement given to the students. To inform international stakeholders about the final qualification of the students from the view of the peers it is necessary to issue a Diploma Supplement in English language as well. It has to contain detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student and has to give an overview about the Mongolian education system. Furthermore it would be wishful to include statistical data in addition to the final mark as set forth in the ECTS User's Guide to allow readers to categorize the individual result of the student.

Criterion 5.3 Relevant rules

Evidence:

- Regulations for Academic and Student Affairs

Preliminary assessment and analysis of the peers:
Comparing to European universities the peers considered a tremendous number of regulations and rules defined by the university. In these different regulations all rights and duties of both the higher education institution and students are clearly defined and they contain all relevant course-related information and are published on the websites of the university.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

The university pointed out correctly in its comment that there was a document called diploma supplement within the report. But this diploma supplement did not include the asked information for stakeholders. Hence the peers suggested a requirement that a Diploma Supplement is given to students which contains detailed information about the educational objectives, intended learning outcomes, the structure, academic level of the degree programme and the individual performance of the student as well as an overview about the Mongolian education system. Further on they suggested a recommendation to provide statistical data according to the ECTS-Users‘ guide in addition to the final grade.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self Assessment Report
- Strategic Development Plan MUST
- Policy and purpose of MUST in quality.
- Discussions with representatives of Must management, programme coordinators, lecturers, business representatives, students

Preliminary assessment and analysis of the peers:
The auditors were explained that the university applied two types of quality assurance system, namely the Internal Quality Assurance and External Quality Assurance systems. The Internal Quality Assurance encompasses all activities focused on the improvement of teaching and learning quality within the university. For each programme a coordinator for the further development is defined who consider the results of the teaching evaluation for the improvements of the programmes. The External Quality Assurance focused on both national and international accreditation.

The internal teaching evaluation takes place each semester for each course. Feedback loops to the head of department, the head of university and to the students are defined. The results of the evaluation could influence the decision of further employment of the single lecturer.

The peers confirm that the programme is subject to regular internal quality assessment procedures aiming at continuous improvement. For the purposes of continued development responsibilities and mechanisms are defined. Collected data are suitable for the purpose and used to continue improving the degree programme, especially with a view to identifying and resolving weaknesses. Students and other stakeholders take part in the quality assurance process.

The peers determined out of the discussion with the students that feedback loops to the students are defined indeed but that they are not realized in an institutionalized way. On the other hand students find out the evaluation results due to the little size of groups in the single lectures and they also see the changes teachers do recognise the changes realised by lecturers. The peers welcomed the obviously close connection between teaching

staff and students and the extensive information exchange between the students. Nevertheless from the view of the peers it is necessary to close the feedback loops with the students as well in order that students get information of evaluation results independently from the engagement of single students or lecturers.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

The university resigned on any comment to this criterion. Hence the peers confirmed their former assessment. They saw the criterion widely fulfilled but suggested a requirement to ensure that students are getting a feedback about the results of the teaching evaluations.

D Additional Documents

No additional documents needed

E Comment of the Higher Education Institution

The university gave a short comment with mainly editorial notes.

F Summary: Peer recommendations

The peers recommend the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Geodesy	With requirements for one year	EUR-ACE® Label	30.09.2022

Requirements

A 1. (ASIIN 1.1) Draft the educational objectives/learning outcomes in a way that they describe also the professional classification of the qualifications gained in the degree programme.

A 2. (ASIIN 2.2) Ensure that the conversion of the Mongolian credit system into the European Credit Transfer System is transparent and correspond for all modules to the ECTS rules with 25-30 hours student workload per ECTS-Point.

A 3. (ASIIN 2.1, 5.1) Rewrite the module descriptions so as to describe qualification objectives more detailed in a competence oriented way and to define the complete student workload of the single courses.

A 4. (ASIIN 3) Ensure that students finishing with an exam have to work problem oriented and independently on a project during their study.

A 5. (ASIIN 5.2) Ensure that a Diploma Supplement is given to students which contains detailed information about the educational objectives, intended learning outcomes, the structure, the academic level of the degree programme and the individual performance of the student as well as an overview about the Mongolian education system.

A 6. (ASIIN 6) Ensure that students are getting a feedback about the results of the teaching evaluations.

Recommendations

E 1. (ASIIN 1.3) It is recommended to give students the opportunity to get knowledge about modern techniques like laser scanning and corresponding methodologies.

E 2. (ASIIN 1.3) It is recommended that data bases and programming languages are dealt in separate courses for all students due to didactical reasons.

E 3. (ASIIN 1.3) It is recommended with a view to internationalisation to enhance English language skills of the students.

E 4. (ASIIN 2.4) It is recommended to improve the opportunities for students to realize a stay at a university abroad.

E 5. (ASIIN 4.1) It is recommended that measures should be taken to improve the research performance of the Department of Geodesy.

E 6. (ASIIN 5.2) It is recommended to provide statistical data according to the ECTS-Users' guide in addition to the final grade

G Comment of the Technical Committee (13.03.2017)

The technical Committee discussed the procedure and followed the assessment of the peers without any changes.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee judges that the intended learning outcomes of the degree programme do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee 03 – Civil Engineering, Geodesy and Architecture.

The Technical Committee 03 – Civil Engineering, Geodesy and Architecture recommends the award of the seals subjected to the final assessment of the peers as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Geodesy	With requirements for one year	EUR-ACE® Label	30.09.2022

H Decision of the Accreditation Commission (31.03.2017)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Committee discussed the procedure and made some editorial changes to clarify the requirements and recommendations. Further on the Committee followed the assessments of the peers and the Technical Committees involved without any additional changes.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee judges that the intended learning outcomes of the degree programme do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee 03 – Civil Engineering, Geodesy and Architecture.

The Accreditation Commission for Degree Programmes decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Geodesy	With requirements for one year	EUR-ACE® Label	30.09.2022

Requirements

A 1. (ASIIN 1.1) Rewrite the educational objectives/learning outcomes in a way that they describe also the professional classification of the qualifications gained in the degree programme.

A 2. (ASIIN 2.2) Ensure that the conversion of the Mongolian credit system into the European Credit Transfer System is transparent and correspond to the ECTS rules with 25-30 hours student workload per ECTS-Point.

A 3. (ASIIN 2.1, 5.1) Rewrite the module descriptions so as to describe qualification objectives more detailed in a competence oriented way and to define the complete student workload of the single courses.

A 4. (ASIIN 3) Ensure that students finishing with an exam have to work problem oriented and independently on a project during their study.

A 5. (ASIIN 5.2) Ensure that a Diploma Supplement is given to students which contains detailed information about the educational objectives, intended learning outcomes, the structure, the academic level of the degree programme and the individual per-formance of the student as well as an overview about the Mongolian education system.

A 6. (ASIIN 6) Ensure that students are getting a feedback about the results of the teaching evaluations.

Recommendations

E 1. (ASIIN 1.3) It is recommended to give students the opportunity to get knowledge about modern techniques like laser scanning and corresponding methodologies.

E 2. (ASIIN 1.3) It is recommended that data bases and programming languages are dealt in separate courses for all students due to didactical reasons.

E 3. (ASIIN 1.3) It is recommended with a view to internationalisation to enhance English language skills of the students.

E 4. (ASIIN 2.4) It is recommended to improve the opportunities for students to realize a stay at a university abroad.

E 5. (ASIIN 4.1) It is recommended that measures should be taken to improve the research performance of the Department of Geodesy.

E 6. (ASIIN 5.2) It is recommended to provide statistical data according to the ECTS-Users‘ guide in addition to the final grade

I Fulfilment of Requirements (23.03.2018)

Requirements

For all degree programmes

A 7. (ASIIN 1.1) Rewrite the educational objectives/learning outcomes in a way that they describe also the professional classification of the qualifications gained in the degree programme.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The university defined new objectives which describe also the professional classification of the qualifications
TC 03	fulfilled Vote: unanimous Justification: The Technical Committee followed the peers without any changes.

A 8. (ASIIN 2.2) Ensure that the conversion of the Mongolian credit system into the European Credit Transfer System is transparent and correspond to the ECTS rules with 25-30 hours student workload per ECTS-Point.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The university made the conversion of credit points transparent and oriented the credits on the student workload.
TC 03	fulfilled Vote: unanimous Justification: The Technical Committee followed the peers without any changes.

A 9. (ASIIN 2.1, 5.1) Rewrite the module descriptions so as to describe qualification objectives more detailed in a competence oriented way and to define the complete student workload of the single courses.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The module descriptions have been adopted according to the requirement.
TC 03	fulfilled Vote: unanimous Justification: The Technical Committee followed the peers without any changes.

A 10. (ASIIN 3) Ensure that students finishing with an exam have to work problem oriented and independently on a project during their study.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: A diploma project has been introduced for all students.
TC 03	fulfilled Vote: unanimous Justification: The Technical Committee followed the peers without any changes.

A 11. (ASIIN 5.2) Ensure that a Diploma Supplement is given to students which contains detailed information about the educational objectives, intended learning outcomes, the structure, the academic level of the degree programme and the individual performance of the student as well as an overview about the Mongolian education system.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The university defined a Diploma Supplement with the asked information.
TC 03	fulfilled Vote: unanimous Justification: The Technical Committee followed the peers without any changes.

A 12. (ASIIN 6) Ensure that students are getting a feedback about the results of the teaching evaluations.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: Feedback loops to the students have been introduced.
TC 03	fulfilled Vote: unanimous Justification: The Technical Committee followed the peers without any changes.

Decision Accreditation Commission on 23.03.2018:

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Geodesy	All requirements fulfilled	EUR-ACE®	30.09.2022

Appendix: Programme Learning Outcomes and Curricula

The following **curriculum** is presented:

Lesson's code	Lesson's name	Lesson's credit		Semester
Basic Courses in General Education:		**72,0**		
A. Required :		**B61.2**		
S.EL102	Communication English	5,4		Spring
S.CT101	General Chemistry	5,4		Spring
E.DT101	Descriptive geometry	5,4		Autumn
S.MT101	Mathematics I	5,4		Autumn
S.MT102	Mathematics II	5,4	S.MT101	Spring
S.PH101	Physics I	5,4		Spring
S.PH102	Physics II	5,4	S.PH101	Autumn
S.IT101	Information Technology Consumption - I	5,4		Autumn
S.PM101	Theory of economics	5,4		Autumn
S.SS102	History of Mongolia	5,4		Autumn
C.GS100	Introduction to Specialty of Geodesy	1,8		Spring
S.MS103	Style and register in language	5,4		Spring
B.Selective:		**B10.8**		
English, other languages:				
S.ES101	Russian I	5,4	S.RL101	Free
Physical education health:				
S.PT101	Civil Defence	1,8		Free
S.PT101	Physical Education	3,6		Free
Civic education:				
S.SS115	Human development	5,4		Free
Social science				
S.SS103	Political science	3,6		Free
S.SS114	Sociology	5,4		Free
S.SS113	Psychology	3,6		Free
Research, methodology				
S.IT102	Information Technology Consumption - II	3,6	S.IT101	Free
Humanities:				
S.EG101	Ecology and environment protection	5,4		Free
S.SS101	Basic of philosophy	5,4		Free
S.SS109	Cultural study	5,4		Free
Speech, writing skills:				
S.MS104	Mongolian script	1,8		Free
Basic Specialized Courses:		**B72**		

A. Required :		**B57.6**		
S.EL210	English for science and technology	5,4	S.CE102	Autumn
S.MT201	ProbabProbability and Statistics	5,4	S.MT102	Autumn
C.GS201	Base of Geodesy	5,4		Autumn
C.GS202	Studies of Surveying instruments	3,6		Autumn
C.GS203	Geodetic measurements processing	5,4	C.GS202	Spring
C.GH216	Principles of Geology and Mineral Resources	5,4		Autumn
C.GS204	Geodetic Network	3,6	C.GS203	Autumn
C.GS205	Theory of Mathematical Processing of Geodetic Measure-ments	3,6	C.GS204	Spring
C.GS206	Digital mapping	3,6	C.GS204	Spring
C.GS207	Cartography	3,6		Spring
C.GS208*	Project "Large-scale topographic survey"	1,8	C.GS204	Spring
C.GS209	Labour Protection of Geodesy Works	1,8		Autumn
C.GS210	Land relations	3,6		Spring
C.GS211	Land use planning	5,4	C.GS211	Autumn
B.Selective:		**B14.4**		
S.MT202	Orinary Differential Equations	5,4		Free
S.CS201	Programming language	5,4		Free
S.MT205	Numerical Method	5,4		Free
C.GS214	Base of Land Management	5,4		Free
C.GS212	Geodetic astronomy	3,6		Free
C.GS215	Land cadastre	1,8		Free
C.GS217	Soil study	3,6		Free
C.GS216	Urban cadastre	1,8		Free
C.GS213	Physical Geography of Mongolia	3,6		Free
Specialized Courses:		**B84.6**		
A. Required :		**B59.4**		
S.EL310	Professional English	3,6	S.EL210	Free
C.GS301	Higher Geodesy	5,4	C.GS208	Autumn
C.GS302	Mathematical Cartography	3,6	C.GS207	Autumn
C.GS303	Photogrammetry I	5,4	C.GS208	Autumn
C.GS304	Photogrammetry II	3,6	C.GS303	Spring
C.GS305	GNSS measurement processing	5,4	C.GS301	Spring
C.GS306	Geographic Information System I	5,4	C.GS302	Spring
C.GS307	Geographic Information System II	3,6	C.GS306	Autumn
C.GS308	Space Geodesy	3,6	C.GS301	Spring
C.GS309	Applied Geodesy I	5,4	C.GS301	Autumn
C.GS310	Applied Geodesy II	3,6	C.GS309	Spring
C.GS311*	Project "Geodetic measurements and mapping"	1,8	C.GS305	Autumn
C.GS312	Gravimetry	3,6	C.GS301	Spring
C.GS313	Remote Sensing	5,4	C.GS304	Spring
B.Selective:		**B25.2**		
S.EL311	English for Advanced Reading and Writing	3,6		Free
S.EL312	Academic Listening and Speaking	3,6		Free
C.GS316	Urban Surveying	3,6		Free
C.GS314	Decipher for Aerial and Satellite Image	5,4		Free
C.GS317	Land Monitoring	5,4		Free

C.GS318	Land administration	5,4		Free
C.GS319	Land valuation	3,6		Free
C.GS315	Industrial Organization of Geodesy and Cartography	3,6		Free
C.GS320	Land management, planning	3,6		Free
F.CS329	Spatial Data Programming	5,4		Free
C. Field Practice Training:		**B3.6**		
C.GS260	Geodetic Training	1,8	C.GS203	Spring
C.GS361	Geodetic Practical Training	1,8	C.GS305	Spring
D. Diploma Thesis, Graduation Examination :		**B9.0**		
C.GS380	Bachelor diploma thesis	9,0		Free
	OR			
C.GS381	Graduation Examination for Bachelor Studies	9,0		Free

UNDERGRADUATE EDUCATION PROGRAM

Basic Courses in General Education:	**72,0**
Basic Specialized Courses:	**72,0**
Specialized Courses:	**84,6**
Field Practice Training:	**3,6**
Diploma Thesis or Graduation Examination	**9,0**
TOTAL:	**241,2**