



# **ASIIN Seal & EUR-ACE Label**

## **Accreditation Report**

**Bachelor's Degree Programme**  
*Textile Technology*

**Master's Degree Programmes**  
*Textile Technology*  
*Textile Chemistry*

Provided by  
**Mongolian University of Science and Technology**  
**(MUST)**

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## A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for <sup>1</sup>	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) <sup>2</sup>
Нэхмэлийн үйлдвэрлэлийн технологи	Ba Textile Technology	ASIIN, EUR-ACE® Label	n/a	01, 05
Нэхмэлийн үйлдвэрлэлийн технологи	Ma Textile Technology	ASIIN, EUR-ACE® Label	n/a	01, 05
Нэхмэлийн үйлдвэрлэлийн хими технологи	Ma Textile Chemistry	ASIIN, EUR-ACE® Label	n/a	01, 05
<b>Date of the contract:</b> 13.03.2019 <b>Submission of the final version of the self-assessment report:</b> 30.06.2019 <b>Date of the onsite visit:</b> 11.-12.09.2019 <b>at:</b> Mongolian University of Science and Technology, Ulan Bator				
<b>Peer panel:</b> Prof. Dr.-Ing. Heinrich Kern, Technische Universität Ilmenau Prof. Dr. Alexander Büsgen, University of Applied Sciences Niederrhein Prof. Dr. Holger Erth, Pfand Textil GmbH Gerelt-Od Ganzorig (student representative), Life Sciences University				
<b>Representative of the ASIIN headquarter:</b> Tobias Buse				
<b>Responsible decision-making committee:</b> Accreditation Commission for Degree Programmes				
<b>Criteria used:</b>				

<sup>1</sup> ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes

<sup>2</sup> TC: Technical Committee for the following subject areas: TC 01 - Mechanical Engineering/Process Engineering; TC 05 - Physical Technologies, Materials and Processes

## A About the Accreditation Process

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<p>European Standards and Guidelines, as of 15.05.2015</p> <p>ASIIN General Criteria, as of 10.12.2015</p> <p>Subject-Specific Criteria of Technical Committee 01 – Mechanical Engineering/ Process Engineering, as of 09.12.2011</p> <p>Subject-Specific Criteria of Technical Committee 05 – Physical Technologies, Materials and Processes, as of 29.09.2016</p>	
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## B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF <sup>3</sup>	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Textile Technology	B. Eng.	n/a	6	Full time	n/a	8 semesters	130 Mongolian credits (234 ECTS credits)	fall semester/spring semester & 1979
Textile Technology	M. Sc.	n/a	7	Full time	n/a	3 semesters	34 Mongolian credits (61.2 ECTS credits)	fall semester/spring semester & 1992
Textile Chemistry	M. Sc.	n/a	7	Full time	n/a	3 semesters	34 Mongolian credits (61.2 ECTS credits)	fall semester/spring semester & 1997

For the Bachelor's degree programme Textile Technology (TT), the Master's degree programme Textile Technology (TT) and the Master's degree programme Textile Chemistry (TC), the Mongolian University of Science and Technology (MUST) did not provide a meaningful profile for each degree programme. The three degree programmes mainly educate graduates with specialized knowledge, skills and competences in the production and processing of wool and cashmere raw materials. The graduates obtain the required skill set that is demanded by the Mongolian textile industry. Thus, the students obtain the relevant knowledge and competences demanded by the local labour market. The auditors request several times a meaningful profile for each of the three degree programmes. However, MUST is not able to provide the three profiles.

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<sup>3</sup> EQF = The European Qualifications Framework for lifelong learning

## C Peer Report for the ASIIN Seal<sup>4</sup>

### 1. The Degree Programme: Concept, content & implementation

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

**Evidence:**

- Study regulations of all three degree programmes
- Examination regulations for all three degree programmes
- Module handbooks for all three degree programmes
- Curricula for all three degree programmes
- Diploma supplements for all three degree programmes
- Objectives-module matrices for all three degree programmes
- Objectives-module matrices for all three degree programmes which exhibit in which way the subject-specific criteria of Technical Committee 01 - Mechanical Engineering/ Process Engineering and the subject-specific criteria of Technical Committee 05 - Physical Technologies, Materials and Processes are implemented
- Discussions with representatives of faculty management, programme coordinators, students, lecturers and business representatives
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The peers take note that the faculty of the textile programmes, the School for Industrial Technology (SIT), describes the objectives and learning outcomes of the three degree programmes in its self-assessment report.

Students of the Bachelor's degree programme Textile Technology (TT) accordingly acquire knowledge, skills and competences concerning textile raw materials, product structures, product types and consumption. Besides fundamental skills in mathematics and science,

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<sup>4</sup> 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.

they learn the basic technology of spinning, knitting, weaving, washing, dyeing, bleaching and finishing the products. Graduates apply their expertise to the engineering of textile product design and to the development of new products. In addition to specialized knowledge in the field of textiles, students also obtain soft skills by implementing projects and research work with team members or on their own. Furthermore, they improve their English language proficiency, as they also work with written documents in English.

The auditors take note of the learning outcomes of the Bachelor's degree programme TT. The primary goal of the programme is to educate students for the Mongolian textile industry with its strong emphasis on cashmere and wool since the Mongolian economy requires this focused education. The auditors regard the objectives of the programme as consistent with Level 6 of the European Qualifications Framework (EQF). The objectives-module matrix for the Bachelor's degree programme demonstrates clearly which knowledge, skills and competences the students acquire through the modules. The auditors' assessment of the aims and intended learning outcomes takes into account the subject-specific criteria of Technical Committees 01 - Mechanical Engineering/Process Engineering and 05 - Physical Technologies, Materials and Processes. These subject-specific criteria are adequately implemented from the auditors' point of view. The auditors regard the learning outcomes as suitable to educate students for the Mongolian textile industry. The employment statistics confirm this conclusion since most graduates find an occupation in this economic sector. Thus, the Bachelor's degree programme TT fulfils the subject-specific criteria for the ASIIN seal as well as for the EUR-ACE label.

Furthermore, the auditors require that the University anchors the learning outcomes in the study regulation of the programme and in the diploma supplement. Since the University does not present a study regulation for the Bachelor's programme, it has to publish this document on its website soon. The University hands in a general study regulation for Bachelor's degree programmes at MUST that does not contain the qualifications objectives of the Bachelor's programme. The learning outcomes are mentioned in the diploma supplement for the Bachelor's programme. However, the auditors urge that MUST hast to provide a new version of the diploma supplement for each degree programme (see criterion 5.2)

The self-assessment report defines similar learning outcomes for the Master's degree programmes Textile Technology (TT) and Textile Chemistry (TC). Students of the two programmes acquire knowledge, skills and competences concerning scientific and technological topics of the textile industry including current developments. Furthermore, they obtain the necessary analytical skills to apply mathematical planning and methods to textile production technology. Students conduct experiments with laboratory equipment for textile production. Besides their specialized knowledge they also obtain foreign language skills as

they have to read and interpret material written in foreign languages like Russian or English. Since students communicate and debate with each other to solve problems, they also improve their communication skills.

When comparing the learning outcomes of the two Master's degree programmes, the peers notice that they are very similar and vary only in a small instance: While the Master's degree programme TC provides students with essential knowledge of the textile industry and advanced processing and finishing technologies, the Master's degree programme TT focuses on expertise in spinning, knitting and weaving. The objectives-module matrices, which the University has provided for both Master's degree programmes, also show rather similar knowledge, skills and competences acquired through the modules. In essence, the learning outcomes are the same; they are merely taught to a different extent in the two programmes. Therefore, the peers conclude that the learning outcomes of the two Master's degree programmes are too generic and do not correspond to level 7 of the European Qualifications Framework (EQF). As a result, the audit team asks the University to draft educational objectives which describe the academic, subject-specific and professional classification of the qualifications gained in the two Master's programmes in a better and more precise way. These educational objectives have to distinguish themselves clearly from the learning outcomes of the Bachelor's degree programme. As outlined below (criterion 1.3), the curricula should be focused more clearly as well. Nevertheless, the peers argue that graduates will find an occupation on the Mongolian labour market which corresponds to their qualification in the field of textiles.

#### *Employability on the Mongolian labour market*

The production of cashmere, wool and yak wool is an important economic sector in Mongolia. The auditors acknowledge that the three degree programmes educate students for the requirements of the Mongolian cashmere and wool industry. The peers regard this aspect as very useful for the local industry since it has a high demand for well-educated employees. Most graduates have found employment in the Mongolian textile industry. The self-assessment report shows the employment statistics for the graduates of textile technology programmes from 2014 to 2018. 85 % of Bachelor's graduates are employed (74.1 % in the professional and 11.1 % in the non-professional field), for instance as knitting or dyeing engineers, designers or quality managers. However, the auditors cannot draw the same conclusion for the two Master's programmes as the University does not provide specific employment statistics for the Master's graduates during the audit. Thus, the peers cannot verify whether the learning outcomes of the two Master's programmes are needed by the Mongolian textile industry at all.

Furthermore, the auditors value the good exchange and collaboration between the University and the textile industry. There is a scientific council with 16 members, 3 of which are industry representatives, which works on the further development of the degree programmes. For each degree programme a team of responsible professors holds meetings every 2 weeks, occasionally accompanied by industry representatives (see criterion 6).

During the audit discussions, the University explains that professors and industry experts were included in formulating and developing the learning outcomes of the degree programmes. Nevertheless, from the auditors' point of view it is not clear why the two Master's programmes TT and TC were introduced at all since they have merely 6 and 2 students, respectively, and very similar learning outcomes. The University responds that the government and the industry have required MUST to offer these two Master's degree programmes since the University is supposed to put a greater emphasis on the development of new technologies in the textile industry, for instance via research projects. As a result, the industry benefits from a more specialized workforce. Although the University expects a rising number of students in the future (see also criterion 4.3), the peers regard the number of students as very low, especially considering the fact that the two Master's degree programmes TT and TC were introduced in 1992 and 1997, respectively, and have still not attracted a high number of students.

Thus, the peers require that MUST defines distinct learning objectives for each Master's degree programme that correspond to EQF level 7. If it is not possible to define separate learning outcomes for the two programmes, the University has to merge them into one Master's programme with two study profiles due to the low number of students.

#### *Summary about the two Master's degree programmes TC and TT*

Taking into account the subject-specific criteria of Technical Committees 01 - Mechanical Engineering/Process Engineering and 05 - Physical Technologies, Materials and Processes, the auditors are of the opinion that they are not implemented adequately by the two Master's programmes as the learning objectives are too generic to achieve the intended level of qualification. Thus, the two Master's programmes do not satisfy the subject-specific criteria for the ASIIN seal and for the EUR-ACE label. During the discussion with teaching staff the auditors conclude that there is no clear concept of the intended learning outcomes of the two programmes. Thus, the peers require that the University either defines distinct learning objectives for each Master's degree programme that match EQF level 7 or transforms the two Master's programmes into one degree programme with two study profiles.

### Criterion 1.2 Name of the degree programme

**Evidence:**

- Curricula of all three study programmes
- Module handbooks for all three study programmes
- Diploma Supplements of all degree programmes
- Discussions with representatives of faculty management and programme coordinators

**Preliminary assessment and analysis of the peers:**

The names of the three degree programmes are defined in the respective module handbooks and curricula. The peers conclude that the names of the programmes reflect the intended aims and learning outcomes as well as the main course language (Mongolian language) in an appropriate manner. The module handbook contains module descriptions that specify the language of instruction for each module.

### Criterion 1.3 Curriculum

**Evidence:**

- Module handbooks for all three degree programmes
- Curricula for all three degree programmes
- Objectives-module matrices for all three degree programmes
- Objectives-module matrices for all three degree programmes which exhibit in which way the subject-specific criteria of Technical Committees 01 - Mechanical Engineering/Process Engineering and 05 - Physical Technologies, Materials and Processes are implemented
- Discussions with representatives of faculty management, programme coordinators, students and lecturers
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

Students of the Bachelor's degree programme TT have to take basic courses of higher education (39 Mongolian credits), basic courses of professional education (35 Mongolian credits) and professional training courses (45 Mongolian credits). Furthermore, they undertake an internship (6 Mongolian credits) during the Bachelor's programme, which can be done in different semesters, and they write a Bachelor's thesis (5 Mongolian credits). Students graduate with 130 Mongolian credits. The basic courses teach basic knowledge in core subjects like Communicative English, General Chemistry, Physics I, Mathematics I + II

and Theoretical Foundations of Economics. The elective subjects also teach other foreign languages (Russian, Chinese) and encompass courses on research and methodology as well as rhetorical and writing skills. The basic courses of professional education contain core subjects like Design of Textile Products, Manufacturing Technology and Textile Material Science, and elective subjects, for instance Textile Marketing, Technology of Specialty Fibres or Carpet Technology. The professional training courses teach further knowledge, for example in the core subjects Spinning Technology, Knitting Technology, Weaving Technology and Methodology of Research and Study, as well as in elective subjects like Industrial Machinery and Equipment, Sewing Technology of Knitwear and Usage of Computers in the Textile Industry I.

The auditors discuss the curriculum of the Bachelor's programme TT. The content of the different courses is taught in lectures, seminars, practical projects and practical trainings with companies. The peers appreciate that students improve their soft skills as the programme offers courses on foreign languages and rhetorical skills as well. Overall, the peers conclude that the educational objective of the degree programme, to educate students for the Mongolian textile industry, is achieved by the modules in the curriculum. The objectives-module matrix demonstrates the implementation of the aims and learning outcomes in the Bachelor's programme, which provides the graduates with the required knowledge, skills and competences. Since the Bachelor's education specifically focuses on the economic sector of textiles in Mongolia, it provides the local textile industry with qualified employees. The peers conclude that the subject-specific criteria of Technical Committee 01 - Mechanical Engineering/Process Engineering and Technical Committee 05 - Physical Technologies, Materials and Processes are executed according to the requirements for the ASIIN seal and the EUR-ACE label.

Students of the Master's degree programme TT have to take basic courses of professional education (10 Mongolian credits), professional training courses (15 Mongolian credits) and courses on research work (4 Mongolian credits). Furthermore, a Master's thesis has to be written (5 Mongolian credits). Students graduate with 34 Mongolian credits in total. The basic courses of professional education encompass courses about the methodology of research (Modelling of Engineering, Patent Study, Methodology of Research and Study) and teach basic theoretical concepts in the modules Research Methodology for Experimental Process and in Research Seminar I, II and III. The professional training courses contain the core subjects Textile Materials Science III and Advanced Textile Fibers and the elective subjects Spinning Technology III, Weaving Technology III, Knitting Technology III, Weaving Structure and Design II; the course Finishing Technology for Textile Materials II is offered as an elective subject in the TT programme whereas it is a core subject for TC. Courses

covering research work include the Research Seminar and Integrated Examination of Foreign Languages.

The auditors debate the curriculum of the Master's programme TT. The content of the courses is taught in lectures and seminars. In addition, Master's students are able to study some courses via e-learning. Students apply the acquired knowledge by writing a final thesis. The auditors note that the Master's programme has a greater focus on research work than the Bachelor's degree, which is clearly visible in the curriculum in the number of courses on research. Students also obtain a deeper knowledge of the textile industry. For instance, the courses Spinning Technology III, Weaving Technology III and Knitting Technology III build upon the Bachelor's courses Spinning Technology I, Weaving Technology I and Knitting Technology I. Furthermore, the peers appreciate that Master's students improve their English language skills through the course "Integrated Examination of Foreign Languages".

Students of the Master's degree programme TC have to take basic courses of professional education (10 Mongolian credits), professional training courses (15 Mongolian credits) and courses on research work (4 Mongolian credits). Furthermore, a Master's thesis has to be written (5 Mongolian credits). Students graduate with 34 Mongolian credits in total. The basic courses of professional education and the courses on research work are the same courses as in the TT programme (see above). However, the professional training courses contain two different core subjects, namely Finishing Technology for Textile Materials II and Advanced Technology & Trends for Textile Materials, and different elective subjects, i.e. Re-engineering for Business Processing, Chemical Technology of Protein Fibers II, Equipment and Usage for Processing of Textile Industry and Structure & Properties of Surface Active Substance. Master's students have the opportunity to enhance their English skills in the course "Integrated Examination of Foreign Languages".

The auditors discuss the curriculum of the Master's programme TC. The contents are delivered by lectures and seminars; additionally, Master's students may study some courses via e-learning. Graduates apply their theoretical expertise in the Master's thesis. The auditors note that the programme stresses the teaching of research work through the many research seminars offered in the curriculum. The professional training courses provide the opportunity to gain a more profound expertise. The peers also value that Master's students have the opportunity to improve their language proficiency in English.

#### *Summary about the two Master's degree programmes TC and TT*

The auditors argue that the curricula of the two Master's degree programmes TT and TC are too similar due to largely the same teaching content. As outlined above (criterion 1.1),

the intended learning outcomes of the two programmes are not clearly distinct. The analysis of the curricula confirms this assessment since the two programmes mainly differ in the elective subjects. The objectives-module matrices also demonstrate that the same knowledge, skills and competences are taught. From the peers' point of view, the University has to sharpen the profiles of the two Master's programmes, demonstrating that students obtain a more profound knowledge in a specific subject area by taking the respective Master's programme. Thus, the peers require the University to develop two distinct curricula for the two programmes with different learning outcomes in the respective modules.

The auditors emphasize that in the future the field of technical textiles will become more important in Mongolia and other Asian countries. For this reason, the curricula require a constant change of educational content according to the emergence and growth of textile markets other than wool and cashmere. The peers strongly recommend a first implementation of technical textiles in the curricula of the two Master's degree programmes to adjust the quantity of this content stepwise subject to the development of technical textiles in Mongolia. This is supported by the peers' observation during the audit discussions that students are interested in learning more about technical textile production as used in other countries. By adding the subject of technical textile production to the curriculum, MUST could attract a higher number of foreign students because the curriculum would cover a globally relevant topic.

Overall, the peers conclude that the subject-specific criteria of Technical Committees 01 - Mechanical Engineering/Process Engineering and 05 - Physical Technologies, Materials and Processes are not met by the modules in the curricula. The two Master's degree programmes mainly qualify students for the Mongolian cashmere and wool industry and do not provide them with a technologically all-encompassing education in the field of textiles. In particular, the auditors conclude that the Master's degree programme TT merely provides the students with a marginal technological increase of knowledge in comparison to the Bachelor's degree TT. Since the University does not provide statistics about Master's graduates during the audit, the EUR-ACE label cannot be awarded as this label requires a degree programme to have graduates. From the auditors' point of view, MUST has to formulate distinct curricula (including modules with different learning outcomes), for the two Master's degree programmes to meet the requirements for the ASIIN seal and the EUR-ACE label.

<b>Criterion 1.4 Admission requirements</b>
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**Evidence:**

- General Regulations for Master and PhD Training & Resolution No.A/63 dated 2011 by the President of MUST on General Regulations for Master and PhD Training and

Degree Defense of the MUST Culture (Annex 2.4, self-assessment report) for the admission to the two Master's degrees TT and TC

- Article 7 of the Mongolian Law on Higher Education & Order No.A/79 dated March 18, 2013 by the Minister of Education, Science, and Culture (Annex 2.3, self-assessment report) for the admission to the Bachelor's degree TT
- Discussions with representatives of faculty management, programme coordinators, students and lecturers
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The admission requirements for the Bachelor's degree programme TT at MUST are based on Article 7 of the Mongolian Law on Higher Education. The procedure for the enrolment process of students is outlined in the general study regulations for Bachelor's programmes at MUST. Graduates of secondary or vocational training schools are able to apply for the entrance examination of MUST. All applicants have to register at MUST on the University website. Applicants for the Bachelor's programme TT have to pass two subject-specific tests as part of the general entrance examination: The first test is in the subject of Mathematics and can be passed with a threshold score of either 480 or 400 points (depending on the score of the second subject test). The second test is in the subject of Physics and can be passed with a threshold score of 400 or 480 points (depending on the score of the first subject test).

The admission requirements for the Master's degree programme TT and the Master's degree programme TC are based on the general regulations for Master's and PhD programmes at MUST. The enrolment process is outlined in the general study regulations for Master's programmes. Applicants for either programme need to hold a Bachelor's degree with a grade point average (GPA) of at least 2.5. Students with a GPA higher than 2.5 only have a personal admission interview at the faculty whereas students with a GPA lower than 2.5 have to pass a professional test and an English language test before being admitted. Applicants who have studied in a similar Master's programme at another university are allowed to transfer 40 % of their previously acquired total credits. Foreign applicants have to hand in additional documents specified by the admission regulations of MUST.

Overall, the auditors establish that the admission requirements for all programmes are defined by governmental orders and rules which are binding and the same for all applicants; however, they seem to be very bureaucratic and difficult to apply in practice.

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

Along with its comment, MUST supplies a document containing short profiles of the three degree programmes, listing the relevant topics and learning outcomes. According to these profiles, the Master's degree TC mainly covers the use of chemical substances in textile processing and finishing, including their role in the production of flame retardant, pilling-resistant, antibacterial, soil-release or easy-to-clean fabrics and their effects on the human body and the environment. The programme TT is more focused on technology, e.g. yarn production, 3D knitting and software design for machines. MUST also provides additional information on the research project leading to the final thesis in all programmes, including formal requirements such as structure and scope, supervision and publication.

According to the employment statistics handed in after the audit, 11 students achieved a Master's degree (either TT or TC) between 2014 and 2018, all of whom are employed – 7 in research institutes such as the Mongolian Textile Institute, 2 at colleges and 1 each as lab researcher and manager in the industry respectively. The University argues based on the current number of high school students that enrolments in the three programmes are expected to rise to 15 for the Bachelor's degree and 5 (TT) or 4 (TC) for the Master's degrees by 2022. Moreover, better target marketing is planned in order to attract more students.

The auditors appreciate that MUST differentiates more clearly between the two Master's profiles and take note of Master's graduates' employability in science and industry, ensuring that the programmes qualify formally for the EUR-ACE label. They confirm their assessment that the curricula for the two Master's degrees are too similar. MUST comments that they intend to merge the two programmes into one degree with two study profiles. The peers welcome this intention.

The auditors conclude that the learning outcomes must be anchored in appropriate documents and made accessible to students and other stakeholders.

In summary, the peers regard the criterion as not fulfilled.

## **2. The degree programme: structures, methods and implementation**

<b>Criterion 2.1 Structure and modules</b>
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**Evidence:**

- Study regulations of all three degree programmes

- Examination regulations for all three degree programmes
- Module handbooks for all three degree programmes
- Curricula for all three degree programmes
- Objectives-module matrices for all three degree programmes
- Objectives-module matrices for the Bachelor's degree programme TT and the Master's degree programmes TT and TC which exhibit in which way the subject-specific criteria of Technical Committees 01 - Mechanical Engineering/ Process Engineering and 05 - Physical Technologies, Materials and Processes are implemented
- Discussions with programme coordinators, students and lecturers
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

*Study structure and duration*

The Bachelor's programme TT runs over the course of 8 semesters (4 years) whereas the duration of the Master's programme TT and TC equals 3 semesters (1.5 years). The three programmes are designed as full-time study programmes and can be started twice per year, either in the fall semester or in the spring semester.

*Modularization*

The curricula of all three degree programmes are divided into modules. Detailed module descriptions are contained in the module handbook for each programme (see criterion 5.1 below).

The Bachelor's Degree TT is split up into basic courses of higher education, basic courses of professional education, professional training courses, an internship and a final research project. The basic courses of higher education, the basic courses of professional education and the professional training courses are divided into core subjects and elective subjects. While the core subjects are mandatory and educate students in basic competences, students can specialize by choosing among several elective subjects.

The Master's degree programme TT and TC are separated into basic courses of professional education, professional training courses, courses on research work and a final research project. The basic courses of professional education are split into courses on the methodology of research and basic theoretical courses, which are both mandatory. The professional training courses are split into mandatory core subjects and elective subjects. Master's students can structure their curriculum individually by choosing a research topic, in line with the clear focus of the programme on research work, and working on this topic e.g. in the module Research Seminar.

During the audit discussions, the University does not explain sufficiently how many elective subjects have to be chosen in the degree programmes. Furthermore, it remains unclear whether the faculty offers all elective subjects in every semester or not. The auditors regard this as an important topic for the two Master's programmes due to the low number of students. While the auditors reason that offering elective courses with only 1 or 2 participants is questionable, MUST states that the elective subjects are always offered, regardless of the number of participants. Nevertheless, the auditors appreciate that students can define their individual focus and course of study through the elective subjects as well as the internship in the Bachelor's programme and the individual research in the Master's programmes. The auditors regard it as very positive that students can pursue their personal interests through the choice of the field of work during the internship and by working on a research article to be published and presented at a conference in the module Research Seminar.

### *Internship*

The curriculum of the Bachelor's degree programme TT offers students the opportunity to do an internship of 6 months in total. However, students can divide this internship into shorter time periods. There are 6 practical modules with 1 Mongolian credit (2 ECTS credits) each, which are equivalent to the internship. Normally, students spend 3 weeks during the semester working for a company. The auditors appreciate that students can gain professional experience during the Bachelor's programme. For instance, they learn how to operate machines processing wool and cashmere. Since many textile companies (e.g. Gobi Company) are based near the university, students can reach their workplace easily. However, the auditors conclude that the credit point assignment is not transparent for the internship as the University allocates 1 Mongolian credit for each practical module, equivalent to 48 hours in the Mongolian credit system. The peers urge the University to verify the amount of time that students work for the company during the internship.

The auditors regard it as very positive that MUST has defined internship regulations. Nevertheless, the University has to prove that the internship regulations are also publicly accessible for the students (see criterion 5.3). Moreover, the auditors argue that the internship regulations should stipulate clearly that the internship company does business in the textile industry and that students gain practical knowledge and skills related to the subject of study. Furthermore, the peers question the overly close contact between the supervising professor and the student as there are daily meetings between professor and student. Noting that the internship is divided into several different modules throughout the curriculum, the peers demand that the University clearly defines at which stage an internship should be undertaken during the Bachelor's degree programme. The peers recommend that the full internship should be done in one time period rather than split up into 6 parts.

### *Mobility*

The auditors discuss the students' mobility in the three degree programmes. The University aims to give students the opportunity to study abroad. Teaching staff encourage students to go abroad by distributing lists with partner universities offering summer programmes. However, no Bachelor's students spend a full semester abroad; student exchange is limited to summer programmes with a maximum duration of 3 months, for instance at universities in China, Russia, South Korea and Japan. The University appears willing to support international student exchange further and the students are interested in foreign exchange semesters as well. However, the auditors note that the University does not have the required rules and regulations for international student mobility. Therefore, the auditors urge the University to improve the current state of international student exchange at MUST. From the peers' point of view the University should redesign the degree programmes so that students can complete a period of vocational practice or a semester abroad without prolonging their studies. The University should also establish an International Office with English speaking staff that takes care of all topics related to international student exchange. Responsibilities would include establishing a learning agreement which documents the transfer of credits that students gain abroad – currently MUST does not have the necessary framework to recognize achievements and competences that are acquired outside the higher education institution. Furthermore, the University should give outgoing students the chance to improve their English further, enabling them to study abroad in English. Conversely, the University should provide more English modules in the degree programmes to give international students from foreign universities the chance to study one semester at MUST in Mongolia.

### *Summary*

The peers appreciate that students can design their individual courses of study and gain work experience during the Bachelor's programme as well as research experience during the Master's programmes. However, from the auditors' point of view the internships should have a transparent credit assignment. It should be stated clearly in the internship regulations at which point in time in the course of the degree programme the internship takes place. In addition, the auditors strongly recommend to improve the conditions for international student exchange because there are no rules for a semester abroad (neither for incoming nor for outgoing students) and no regulations to recognize achievements and competences acquired outside the higher education institution.

<b>Criterion 2.2 Work load and credits</b>
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**Evidence:**

- conversion table: calculation of Mongolian credits into ECTS credits for all three degree programmes
- Module handbooks for all three degree programmes
- Module descriptions for all three degree programmes
- Curricula for all three degree programmes
- Discussions with programme coordinators, students and lecturers
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The University provides a conversion table which includes the transfer of ECTS credit points into Mongolian Higher Education credit points for all modules in the three degree programmes. It also transfers the Mongolian credits into workload hours in the ECTS and the Mongolian credit systems.

- 1 Mongolian credit = 2 ECTS credits
- 1 ECTS credit = 25-30 workload hours in the ECTS system
- 1 Mongolian credit = 48-60 workload hours in the Mongolian credit system

The peers criticize that a range rather than a number is specified for the workload hours because 1 ECTS credit should equal a fixed number of hours for the average student workload. Based on the equivalence of 1 Mongolian credit and 2 ECTS credits, the auditors would expect a range of 50-60 Mongolian workload hours (instead of 48-60 hours). Overall, the auditors are able to understand the credit conversion table. Nevertheless, they recommend to announce ECTS credits with integer rather than decimal numbers. The peers also stress that the conversion table has to be updated if the curricula of the degree programmes are changed.

Overall, the students confirm that the workload is manageable for all three programmes. The auditors ascertain that students are able to graduate successfully at MUST. For instance, the Bachelor's programme TT normally takes 8 semesters. Depending on a student's choice of courses and performance, the programme may be completed within 7 to 10 semesters. The faculty representatives state that 80 % of students complete the Bachelor's programme in 8 semesters, 5 % in less than 8 semesters and 15 % in more than 8 semesters. The auditors cannot draw similar conclusions for the two Master's degree programmes since MUST has not provided such data.

### Criterion 2.3 Teaching Methodology

**Evidence:**

- Module handbooks for all three degree programmes
- Module descriptions for all three degree programmes
- Curricula for all three degree programmes
- Discussions with programme coordinators, students and lecturers
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The teaching methods of the three degree programmes are described in the module handbooks. As traditional teaching methods, lectures and seminars are utilized in all three degree programmes. In addition, the Bachelor's programme TT includes laboratory exercises, practical trainings and projects with companies. The teaching methods are based on the CDIO (Conceive, Design, Implement, Operate) methodology, which aims to provide students with basic technical knowledge. The two Master's programmes TT and TC rely on the above-mentioned traditional teaching methods. In addition, Master's students conduct laboratory experiments for their research. The seminars have a strong focus on research work as the students write articles for scientific journals, conduct research and engage in discussions and debates. Overall, the auditors conclude that the curricula are well suited to convey the expertise, skills and competences for each degree.

According to the peers, all three programmes comprise a variety of teaching and learning forms as well as internships and practical projects that are adapted to the respective subject culture and study format. For instance, the students apply their theoretical knowledge during an internship in the Bachelor's degree programme TT.

### Criterion 2.4 Support & Assistance

**Evidence:**

- Discussions with programme coordinators, students and lecturers
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The self-assessment report mentions that MUST organizes an open day to provide high school students interested in a degree programme with essential information about the study programmes and about MUST in general. As roughly half of all high school graduates go to university and MUST expects between 4.000 and 5.000 new graduates in upcoming years, the peers regard such events as very useful.

The University's support and guidance offered to students at MUST is mainly based on the "supervising professor approach", in which professors give advice to students and answer questions about modules that students want to select in the next semesters. This support is very useful for newly admitted students, who have to familiarize themselves with the University. The peers regard it as very positive that the supervising professors are involved in the organization of the University's open day as well.

The auditors note that the University has students with diverse cultural backgrounds and has developed a certain degree of awareness for equality and diversity. For example, MUST has addressed the needs of disabled persons by equipping the new faculty building with elevators for wheelchair users. However, the auditors argue that the University should develop a concept of diversity management to improve the ability of disabled and disadvantaged persons to study at MUST. In this context, the peers recommend that the University should include a "compensation of disadvantages" for disabled and disadvantaged persons in the respective study and examination regulations.

To summarize, the auditors regard the available resources as sufficient to provide individual assistance and support for all students. However, MUST should further develop and structure this support.

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

The University provides additional information on the elective subjects with its comment, including lists of all courses noting the semester in which they are offered (spring, fall or "random"). In total, elective subjects make up 20 Mongolian credits in the Bachelor's programme and 9 credits in either Master's programme.

MUST refers to an improved version of the internship regulation, which points out that credits are valued differently in classroom and industrial settings respectively, as teaching and studying in class, guided by lecturers, is considered more efficient than applying skills and knowledge in a business environment. Thus, 1 Mongolian credit is equivalent to 48 hours of coursework or 144 internship hours. In other words, only a third of the time students spend working for a company is credited as study time, whereas the remainder is regarded as a paid internship (for which students receive wages). Students are required to record their activities and amount of work in a diary. The internship regulation differentiates between the six practice modules, three of which are in fact taught in-class; in the curriculum – which should be made available to students, see 5.3 – they are assigned to different semesters. The peers recommend that at least the industry internship should be done in one part rather than split up.

Concerning student mobility, MUST adds further explanations regarding English language education in the three degree programmes. The peers appreciate SIT's efforts to confront students with English material as well as the teachers' motivation to improve their own language skills. They point out that courses taught completely in English would make the programmes more attractive to international students.

MUST provides new tables outlining the conversion between Mongolian and ECTS credits. According to these documents, 1 Mongolian credit is equivalent to a workload of 48 hours (in accordance with the module descriptions) or 1.8 ECTS credits, implying that 1 ECTS credit corresponds to 26,67 hours (or 3 ECTS credits to 80 hours, using integers). The conversion coefficient of 1.8 was established in official statement No. A-188 by MUST's president in 2015.

Finally, taking into account the description of the curricula, the audit discussions, the exams and the visit of the laboratories, the peers conclude that weaving education at MUST does not meet EQF level 7 and is not sufficient for a Master's degree. Consequently the criterion is considered fulfilled only for the Bachelor's degree programme.

### 3. Exams: System, concept and organization

<b>Criterion 3 Exams: System, concept and organisation</b>
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**Evidence:**

- Study regulations of all three degree programmes
- Examination regulations for all three degree programmes
- Module handbooks for all three degree programmes
- Self-assessment report
- Discussions with representatives of faculty management, programme coordinators, students and lecturers

**Preliminary assessment and analysis of the peers:**

MUST provides the examination regulations for the three degree programmes. The module descriptions inform about the form of assessment and the number and duration of exams in the respective modules. The three degree programmes all require a thesis which ensures that students work on a set task independently. The forms of assessment used in the Bachelor's degree TT are written exams, oral exams, online exams via PC and an exhibition. The modules also contain pre-examination elements, for instance practical projects, laboratory

tasks, mid-term tests and assignments which are part of the final grade. The Master's degree programmes TT and TC use written exams, presentations of research results and the publication of a research article with a talk at an academic conference. Furthermore, they apply assignments, practical projects and laboratory experiments as pre-examination elements which contribute to the final grade. The auditors note that the forms of assessment in the Master's programmes have a stronger tendency to test students' research knowledge. For instance, the module Research Seminar I requires students to publish a research article and to give a talk about this article at a scientific conference. This observation is supported by the curricula of the two Master's programmes, which contain more research-oriented subjects than the Bachelor's programme (see criterion 1.3).

The auditors question whether students have sufficient time to prepare for exams since several pre-examination elements contribute to the final grade. However, the students do not confirm the peers' concerns. Moreover, the auditors notice that written exams contribute only 30 % to the final grade in all three degree programmes, which is a comparatively small fraction. They recommend to increase this percentage.

The audit team also inspects sample exams, covering the modules Textile Finishing, Knitting and Mathematics for the Bachelor's degree and the modules Spinning III, Textile Materials Science III and Weaving Technology III for the Master's degree. The peers note that all exams rather resemble catalogues of questions. While the exams on Knitting, Textile Finishing, Mathematics and Textile Materials Science III exhibit a sufficient academic level to test the knowledge of students, the auditors cannot draw the same conclusions for the other two Master's level exams (Weaving Technology III and Spinning III), which do not correspond to EQF level 7. In fact, the peers see little difference between the questions from the Bachelor's and Master's exams as they all test students' basic knowledge and competences. Thus, it is recommended to better align the range of possible forms of examination in the Bachelor's and Master's modules with the intended learning outcomes of the respective modules. In essence, the auditors recommend to develop questions which check the basic knowledge required at the Bachelor's level and the more detailed and profound expertise at the Master's level.

Moreover, the University provides examples of Bachelor's and Master's theses in English during the audit, which the peers inspect. They conclude that the academic level of the Bachelor's theses is appropriate. However, they deem the Master's theses in both TT and TC to be inadequate, as they do not meet expectations regarding scientific questioning and tasks. Research orientation and scientific level are not sufficient in the Master's degree programmes and must be raised.

Overall, the auditors conclude that the exam system at the faculty is only partially appropriate to test the learning outcomes formulated in the module descriptions. According to the auditors, the academic level of the Bachelor's exams and theses meets the requirements for the ASIIN seal and the EUR-ACE label whereas the same conclusion cannot be drawn for the Master's programmes. The auditors therefore ask the University to ensure that the academic level of the Master's exams and theses corresponds to EQF level 7 in order to qualify for the respective seal and label.

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

MUST provides new versions of the two Master's level exams criticized by the peers during the audit. While the auditors judge the level of the Spinning III exam to be appropriate, they deem the Weaving III exam to be inappropriate for a Master's degree and conclude that only the Bachelor's degree programme fulfils this criterion.

## 4. Resources

### Criterion 4.1 Staff

**Evidence:**

- presentation about MUST, with facts and figures
- teaching staff handbook for the three degree programme
- Table about teaching staff in the Bachelor's degree programme (self-assessment report, p. 64)
- Table about teaching staff in the two Master's degree programmes (self-assessment report, p. 6)
- Self-assessment report
- Discussions with representatives of faculty management, programme coordinators, students, lecturers and business representatives

**Preliminary assessment and analysis of the peers:**

The institute provides staff handbooks for each of the three degree programmes, which provide a good overview of the teaching staff responsible for the respective modules. The Bachelor's programme TT has 13 teachers, 10 professors, 1 senior adjunct professor, 1 adjunct professor, and 1 training master. There are 2 teachers with a Doctor of Science, 6 teachers with a PhD and 5 teachers with a Master's degree. The Master's programmes TT

and TC are covered by 10 teachers in total: 7 professors, 1 senior adjunct professor, 1 adjunct professor and 1 Master's graduate. There are 3 teachers with a Doctor of Science, 4 teachers with a PhD and 1 teacher with a Master's degree.

The auditors conclude that there is a good ratio of teaching staff to students: the Bachelor's degree programme TT has a ratio of 3.3 while the ratios for the Master's degree programmes TT and TC – in which only 8 students are enrolled – equal 1.7 and 5, respectively. As the University has been required by the government and by the industry to introduce the two Master's degree programmes (see criterion 1.1), they are maintained despite the low number of students. However, the University expects a rising number of students for these two degree programmes in the future.

The peers conclude from the audit discussions that all teachers in the three degree programmes have long-lasting work experience of more than 10 years as well as the necessary academic background to teach in the three degree programmes. Therefore, the peers regard the teaching staff as fully capable to teach the students adequately. Teachers appear highly engaged and motivated as the auditors note extremely high working hours among the educational staff (above the normative number of working hours set by MUST's president); they receive a payment for overtime hours. While the auditors do not expect negative effects on the teaching capacity in the three programmes, they are nevertheless surprised, as the relatively low student numbers should not demand such a high workload. Therefore they request a matrix which specifies the number of hours that teachers are involved in other degree programmes in addition to the three degree programmes to be accredited. However, the University provides a matrix which merely shows the distribution of teaching hours among the three degree programmes. This matrix illustrates that the majority of the faculty's teaching hours is absorbed by the mandatory and elective courses in the Bachelor's degree programme TT. In total, teachers in the three degree programmes provide teaching equivalent to 197 Mongolian credits (9456 hours) in one academic year, of which 103 Mongolian credits (4944 hours) contribute to the Bachelor's degree programme TT and 47 Mongolian credits (2256 hours) to each of the two Master's degree programmes TT and TC, respectively. Overall, the auditors are able to understand the distribution of teaching hours based on this matrix. They reason that teaching capacity is sufficient for the three degree programmes under review.

<b>Criterion 4.2 Staff development</b>
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**Evidence:**

- List of all educational trainings and workshops for the teaching staff (p. 81, self-assessment report)
- Table with international projects of academic staff (p. 71, self-assessment report)

- Discussions with representatives of faculty management, programme coordinators and lecturers
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The faculty assigns its academic staff to the three degree programmes according to a specific policy. Teachers with Master's level education teach in the Bachelor's degree programme while teachers with higher academic degrees teach in the two Master's degree programmes.

MUST plans its educational staff policy with the teacher development centre, founded in 2015, which aims to support professors' and lecturers' professional progress. For instance, the centre offers trainings to improve teaching methodology, technological knowledge or foreign language proficiency. Lecturers and professors are encouraged to participate in workshops, educational trainings, international exhibitions and seminars related to the textile industry.

Since the three degree programmes mainly educate students for work in the Mongolian textile industry with a focus on cashmere and wool production, trainings are closely linked to new developments and demands in the sector of cashmere and wool in Mongolia. The University provides a list of all educational trainings and workshops for the faculty's teaching staff. In total, 64 professors – including 11 attached to the three programmes under review – attended such trainings from 2014 to 2018, for instance a 2-day introductory training on CDIO methodology or a 5-day CDIO training for innovation and design of new products.

Teaching staff are expected to have studied abroad at an international university or to have completed courses to improve their language skills during their doctoral studies. The University provides a table listing international projects implemented by its academic staff, such as a joint project with the Dutch government about value-added cashmere production and a project with the EU and the Czech development bank about turning sheep wool into environmentally friendly building material.

Overall, the auditors value that the vast majority of teachers in the three degree programmes participate in trainings and workshops to stay informed about current developments and trends in industry and teaching. Since the University also organizes annual scientific meetings, seminars and workshops with Mongolian companies and business and professional associations, there is a constant exchange of ideas between the university staff and industry representatives. As a result, staff are able to apply their new expertise to teaching at MUST.

<b>Criterion 4.3 Funds and Equipment</b>
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**Evidence:**

- overview of classes, halls, laboratories of the faculty building (p. 89, self-assessment report)
- List of laboratory equipment, investment and usage (p. 92, self-assessment report)
- Table with financial indicators of MUST (p. 110, self-assessment report)
- presentation about MUST, with facts and figures
- Discussions with representatives of faculty management, programme coordinators, students, lecturers and business representatives
- self-assessment report
- on-site visit of laboratories and library

**Preliminary assessment and analysis of the peers:**

As mentioned above under criterion 1.4, MUST expects a rising number of students in the future. The peers recommend to calculate the expected number of students for each degree programme for the upcoming years in order to plan the faculty's capacity more accurately. In addition to the faculty's plans to increase the number of teachers at SIT to match the rise in students. MUST is currently constructing a new building to prepare for the larger numbers. Moreover, the faculty's existing laboratories have been renovated recently.

The University is able to guarantee sufficient funds due to financial support from the government. Since the government has defined the textile industry as one of the leading economic sectors in Mongolia, it supports universities that educate future employees of the textile industry. MUST's director's council meets annually to discuss target commitments for the number of students. During these meetings, the financial budget is allocated to the different faculties, depending on the number of students expected in the respective study programmes and on the demand to buy new machines for the next academic year. If a machine breaks down suddenly during the semester, the faculty can obtain money from the University's risk fund to buy new equipment. In addition, it is possible to ask for financial support from the private sector as the faculty maintains close collaborations with companies. According to the self-assessment report, MUST funds 54 % of its total assets internally from tuition fees while the remaining 46 % are financed through government funds and funds from the private sector acquired in research projects. The self-assessment report lists the University's total assets, total expenses and net earnings from 2013 to 2017.

SIT consists of several classrooms, laboratories and laboratory equipment, intended to educate students in practical skills. For instance, there is the Shima Seiki Training Centre which

contains 14 Shima Seiki machines. The training centre is equipped with several Intashi textile automate machines and with modern and computer-based knitting machines that manufacture nonwoven textile products. The centre is used to conduct trainings and experiments and to develop innovations. Students benefit from the laboratory equipment as they learn how to operate the textile machines used by the industry. Since the cashmere and wool industry mainly uses flatbed machines, the laboratories are well-equipped to educate students in a practical way. In this context, the auditors regard it as extremely positive that the faculty has a very modern laboratory for flat knitting.

In summary, the auditors conclude that the laboratory equipment is mostly sufficient both to teach basic competences at the level of the Bachelor's degree programme and to support more advanced experiments at the level of a Master's degree programme. The majority of the laboratories has state-of-the-art equipment. Nevertheless, from the auditors' perspective it is necessary to obtain funding for new weaving machines as the weaving laboratory in particular is outdated. Therefore, the peers urge SIT to update the equipment in the weaving laboratory to prepare the students sufficiently for their future employment.

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

MUST presents a table listing the number of high school graduates, the total number of enrolments at MUST and enrolments in each programme between 2014 and 2020 as well as the projected values for upcoming years. By 2023, the number of students is expected to rise from an average of 13 in previous years to 15 in the Bachelor's degree programme, from 2 to 5 in the Master's programme TT and from 2 to 4 in the Master's programme TC. If the two Master's programmes are merged, MUST expects student numbers to add up to 9 enrolments in 2023. The peers acknowledge that SIT has a solid base for calculating resources.

The University also presents recent and planned updates to the laboratory equipment, in part supported by the UNIDO. The peers repeat that the weaving education in particular needs to be improved.

The peers confirm their initial assessment and regard the criterion as not fulfilled.

## 5. Transparency and documentation

### Criterion 5.1 Module descriptions

**Evidence:**

- Module handbooks for all three degree programmes

**Preliminary assessment and analysis of the peers:**

The module handbooks of the three degree programmes contain the respective module descriptions. Each module description informs about the identification code, the person responsible for the module, contents, learning outcomes, teaching and learning methods, prerequisites for participation, the applicability of the module, Mongolian credits, the grading, student workload, the last amendment date, recommended literature and forms of assessment and exam requirements. The auditors value that the module handbook of the Bachelor's degree TT is available to students via Unimis. However, they demand that the module handbooks for the two Master's degree programmes TT and TC can also be accessed online in English, which is not possible during the audit.

### Criterion 5.2 Diploma and Diploma Supplement

**Evidence:**

- Exemplary diplomas and academic transcripts for all programmes
- Exemplary diploma supplements for all programmes
- General study regulations for Bachelor's and Master's degree programmes
  - "Regulation Procedure of Mongolian Technical University of Science and Technology to Provide Master Degree and Ph.D Degree Education"
  - "Regulation on Governing Bachelor's Program Activities of the University of Science and Technology"
- General examination regulations for Bachelor's and Master's degree programmes
  - "Regulation of Examination for Bachelor's Program at the Mongolian University of Science and Technology"
  - "Regulation of Examination for Master and Ph.D Degree Program at the Mongolian University of Science and Technology"
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The auditors inspect the general examination regulations for Bachelor's programmes at MUST. They are satisfied that the University mentions the award of a Bachelor's or Master's diploma under certain conditions in the examination regulations for Bachelor's programmes at MUST.

Furthermore, the University presents examples of Bachelor's and Master's certificates and transcripts of records for the three degree programmes as well as the diploma supplements. The auditors establish that the submitted certificates have the required form and content.

<b>Criterion 5.3 Relevant rules</b>
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**Evidence:**

- General study regulations for Bachelor's and Master's degree programmes
  - "Regulation Procedure of Mongolian Technical University of Science and Technology to Provide Master Degree and Ph.D Degree Education"
  - "Regulation on Governing Bachelor Program Activities of the University of Science and Technology"
- General examination regulations for Bachelor's and Master's degree programmes
  - "Regulation of Examination for Bachelor Program at the Mongolian University of Science and Technology"
  - "Regulation of Examination for Master and Ph.D Degree Program at the Mongolian University of Science and Technology"
- Internship regulation at MUST (for the Bachelor's programme TT)
  - "Procedures for Industrial Training (Internship) Course of Bachelor Degree of MUST"
- Module handbooks for all programmes accessible for students via <https://student.cloudmis.edu.mn>.
- Self-assessment report

**Preliminary assessment and analysis of the peers:**

The University hands in the general study regulations and the general examination regulations as well as the internship regulations at MUST. The peers inspect the English translations and detect many errors, such as the expressions "diploma thesis protection" and "credit estimation exam".

During the audit, MUST does not demonstrate that the relevant rules and regulations are publicly available. Therefore, the peers ask the University to prove that the general study regulations, the general examination regulations and the internship regulations are accessible to students and other stakeholders.

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

MUST makes the module handbooks of the three programmes as well as all relevant regulations publicly available online after the audit. The peers appreciate this quick response. They also thank the University for providing new and improved translations of the study and examination regulations. The peers regard the criterion as fulfilled.

## **6. Quality management: quality assessment and development**

### **Criterion 6 Quality management: quality assessment and development**

**Evidence:**

- Questionnaire of the student survey on the degree programmes
- Questionnaire of the graduate survey on the degree programmes
- Self-assessment report
- Discussions with representatives of faculty management, programme coordinators, students, lecturers and business representatives

**Preliminary assessment and analysis of the peers:**

The University provides questionnaires for student and graduate surveys on the quality of the programmes. In addition, the faculty representatives explain the quality management system at MUST during the audit discussions. Students are asked to fill out the student survey anonymously via the Internet. Faculty members discuss the results during a meeting at the end of the semester and suggest improvements for the upcoming semester. If a professor scores very low, the faculty schedules an individual meeting to help them improve their performance.

Each faculty has a team of professors who work on improving the degree programmes continuously and hold brief meetings every 2 weeks, which are occasionally accompanied by industry representatives. These meetings serve to discuss possible improvements to the three degree programmes. To suggest changes, the professors send a proposal to the scientific council of SIT. The content of the study programmes is regularly reviewed and adjusted by this scientific council, which conducts meetings every 2 months. In total, the scientific council has 16 members including 3 representatives from the textile industry, which proves the University's close collaboration with industry engineers. Motivated by the involvement of industry peers in the scientific council, the University does research on more

eco-friendly processing in the textile industry to set new processing standards. Furthermore, the University plans to increase research on home textiles as the industry is interested in this textile segment as well. The peers regard it as very positive that industry peers are involved in the quality management process.

In summary, the auditors appreciate that the University conducts student and graduate surveys to evaluate its degree programmes. However, they suggest that the graduate survey could be further improved by including more specific questions related to textile technology in addition to the general questions of previous surveys. Furthermore, questionnaires should be distributed by persons other than the teaching staff. The auditors acknowledge that the University aims to achieve a high quality of teaching since it takes corrective measures if a professor receives low scores for their lessons. Nevertheless, they conclude that quality management at MUST has to be further improved. They reason that the University has to establish and set down a comprehensive concept of quality management defining all quality development procedures related to the three degree programmes. This concept should describe the exchange between the University and all stakeholders who contribute to the development of the programmes. Furthermore, the concept has to state that changes to the curricula contribute to the achievement of the intended learning outcomes of the three degree programmes.

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

MUST states that they intend to review the graduate survey and incorporate more detailed questions related to the quality of the study plan and syllabus. They also present employment statistics, demonstrating that they do follow up graduates' success in science and industry. The University is in the process of implementing a quality management system according to the standards of ISO 9001:2015 and ISO 21001:2018. The peers welcome these efforts. As MUST plans to establish their QMS by December 2020, the auditors are optimistic that the University can meet their requirements and recommendations on quality management and fulfil this criterion.

## **D Additional Documents**

Before preparing their final assessment, the panel ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

- D 1. Figures on the average study duration for Master's graduates;
- D 2. Employment statistics for graduates of the two Master's degree programmes TT and TC;
- D 3. Links that prove that students have online access to the study regulations, examination regulations and internship regulations;
- D 4. Short profiles for each of the three degree programmes (the previously submitted profiles were not meaningful);
- D 5. Links which prove that students can access the module handbooks for the two Master's degree programmes TT and TC (the provided link and login data only work for the Bachelor's degree programme TT) ;
- D 6. Curricula which indicate in which semester the courses of the degree programmes are offered
- D 7. Improved English version of the Regulation of Examination for the Bachelor's degree.

## **E Comment of the Higher Education Institution (17.01.2020)**

The institution provides an extensive statement as well as the following additional documents:

- Combined employment statistics for graduates of the two Master's degree programmes;
- Links to the study, examination and internship regulations as well as the module handbooks available on MUST's homepage;
- Short profiles including the learning outcomes for all three degree programmes;
- Curricula for all three programmes indicating in which term each course can be taken;
- An improved translation of the examination regulations for the Bachelor's degree programme.

MUST also remarks on the study duration in the Master's programmes but does not provide statistical data. In addition, they present tables listing contact hours, self-study time and ECTS credits for all courses.

## F Summary: Peer recommendations (18.05.2020)

Taking into account the additional information and the comments given by 18.05.2020 the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Textile Technology	With requirements	EUR-ACE®	30.09.2025
Ma Textile Technology	With requirements	EUR-ACE®	30.09.2025
Ma Textile Chemistry	With requirements	EUR-ACE®	30.09.2025

### Requirements

#### For all degree programmes

- A 1. (ASIIN 1.1) Make the qualification objectives publicly accessible for all relevant stakeholders and ensure that the stakeholders can refer to them.
- A 2. (ASIIN 2.1) Implement rules for the recognition of achievements and competences acquired outside the University (Learning Agreement).
- A 3. (ASIIN 6) Provide a concept for quality management.

#### For the Bachelor's degree programme

- A 4. (ASIIN 2.1) Establish clear and binding regulations for internships, including at which point(s) in the course of study they should be completed.

#### For the Master's degree programmes

- A 5. (ASIIN 1.1) Develop distinct qualification objectives for the two Master's degree programmes that describe the academic, subject-specific and professional qualifications gained in each programme.
- A 6. (ASIIN 1.3) Develop distinct curricula for the two Master's degree programmes that clearly reflect the different learning outcomes.

- A 7. (ASIIN 2.1) Improve the academic level of weaving education (both theoretical and practical) to achieve EQF level 7.
- A 8. (ASIIN 3) Ensure that weaving exams reflect the academic level of a Master's degree (EQF level 7).
- A 9. (ASIIN 4.3) Update the equipment in the weaving laboratory.

### **Recommendations**

#### **For all degree programmes**

- E 1. (ASIIN 2.1) Introduce measures to support international student exchange (e.g. offer courses in English, establish mobility windows, install an International Office).
- E 2. (ASIIN 2.1) Add modules to the curricula of the degree programmes that teach students about current technological developments in the technical textile industry.
- E 3. (ASIIN 2.4) Develop a concept for diversity management
- E 4. (ASIIN 2.4) Introduce a "compensation of disadvantages" in the study or examination regulations.
- E 5. (ASIIN 3) Increase the percentage that written exams contribute to the final grade.
- E 6. (ASIIN 6) Add questions focusing specifically on textile technology to the graduate survey.
- E 7. (ASIIN 6) Distribute the student and graduate surveys via a third party rather than teaching staff.

#### **For the Bachelor's degree programme**

- E 8. (ASIIN 2.1) Amend the internship regulations to outline more strongly that the internship company does business in the textile industry and that students improve their practical knowledge related to the subject of study.
- E 9. (ASIIN 2.1) Merge the phases of practical training so that the full industry internship is done in one time period.

## **G Comment of the Technical Committees**

### **Technical Committee 01 – Mechanical Engineering/Process Engineering (10.06.2020)**

*Assessment and analysis for the award of the ASIIN seal:*

With regard to the Bachelor's degree programme the Technical Committee agrees with the peers' evaluation; they remove the reference to a "learning agreement" from requirement A2, as rules for the recognition of qualifications can and must also be implemented in other ways. The additional requirements for the two Master's programmes, however, indicate severe deficiencies, which cannot be corrected in the short term. First, there needs to be a clear distinction between the two programmes, comprising not only a more precise definition of the qualification objectives, but also extensive adjustments in the curricula. Second, weaving education must be revised in order to meet the demands of a Master's degree; this includes teaching contents, exams and laboratory equipment. The Technical Committee therefore recommends suspending the accreditation procedure for the two Master's degree programmes.

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

The Technical Committee deems that the intended learning outcomes of the Bachelor's degree programme comply with the engineering specific part of the Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering.

The Technical Committee deems that the intended learning outcomes of the Master's degree programmes do not comply with the engineering specific part of the Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering.

The Technical Committee 01 – Mechanical Engineering/Process Engineering recommends the award of the seals as follows:

<b>Degree Programme</b>	<b>ASIIN-seal</b>	<b>Subject-specific label</b>	<b>Maximum duration of accreditation</b>
<b>Ba Textile Technology</b>	With requirements	EUR-ACE®	30.09.2025

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ma Textile Technology	Suspension	EUR-ACE® suspended	-
Ma Textile Chemistry	Suspension	EUR-ACE® suspended	-

### For the Bachelor's degree programme

#### Requirements

- A 1. (ASIIN 1.1) Make the qualification objectives publicly accessible for all relevant stakeholders and ensure that the stakeholders can refer to them.
- A 2. (ASIIN 2.1) Implement rules for the recognition of achievements and competences acquired outside the University.
- A 3. (ASIIN 6) Provide a concept for quality management.
- A 4. (ASIIN 2.1) Establish clear and binding regulations for internships, including at which point(s) in the course of study they should be completed.

#### Recommendations

- E 1. (ASIIN 1.3) Add modules to the curriculum that teach students about current technological developments in the technical textile industry.
- E 2. (ASIIN 2.1) Introduce measures to support international student exchange (e.g. offer courses in English, establish mobility windows, install an International Office).
- E 3. (ASIIN 2.4) Develop a concept for diversity management.
- E 4. (ASIIN 2.4) Introduce a "compensation of disadvantages" in the study or examination regulations.
- E 5. (ASIIN 3) Increase the percentage that written exams contribute to the final grade.
- E 6. (ASIIN 6) Add questions focusing specifically on textile technology to the graduate survey.
- E 7. (ASIIN 6) Distribute the student and graduate surveys via a third party rather than teaching staff.
- E 8. (ASIIN 2.1) Amend the internship regulations to outline more strongly that the internship company does business in the textile industry and that students improve their practical knowledge related to the subject of study.

- E 9. (ASIIN 2.1) Merge the phases of practical training so that the full industry internship is done in one time period.

**For the Master's degree programmes**

**Prerequisites**

- V 1. (ASIIN 1.1 / 1.3) Develop distinct curricula and qualification objectives for the two Master's degree programmes.
- V 2. (ASIIN 2.1 / 3 / 4) Provide a concept that demonstrates how EQF level 7 is to be achieved in theoretical and practical weaving education and assessment.

**Possible requirements**

- A 1. (ASIIN 1.1) Make the qualification objectives publicly accessible for all relevant stakeholders and ensure that the stakeholders can refer to them.
- A 2. (ASIIN 2.1) Implement rules for the recognition of achievements and competences acquired outside the University.
- A 3. (ASIIN 6) Provide a concept for quality management.

**Possible recommendations**

- E 1. (ASIIN 1.3) Add modules to the curricula of the degree programmes that teach students about current technological developments in the technical textile industry.
- E 2. (ASIIN 2.1) Introduce measures to support international student exchange (e.g. offer courses in English, establish mobility windows, install an International Office).
- E 3. ((ASIIN 2.4) Develop a concept for diversity management.
- E 4. (ASIIN 2.4) Introduce a "compensation of disadvantages" in the study or examination regulations.
- E 5. (ASIIN 3) Increase the percentage that written exams contribute to the final grade.
- E 6. (ASIIN 6) Add questions focusing specifically on textile technology to the graduate survey.
- E 7. (ASIIN 6) Distribute the student and graduate surveys via a third party rather than teaching staff.

## Technical Committee 05 – Physical Technologies, Materials and Processes (15.06.2020)

### *Assessment and analysis for the award of the ASIIN seal:*

The Technical Committee follows the peers' assessment of the Bachelor's programme. However, they are concerned that weaving education in the two Master's degree programmes is not adequate for EQF level 7 according to the peers, particularly as both programmes cater to one of the country's most important industries. As the deficiencies do not appear to be easy to remedy, the Technical Committee suggests suspending the accreditation procedure for the two Master's programmes. The HEI should provide a concept for teaching and assessment which ensures Master's level education in all subjects, taking into account demands on the laboratory equipment and quality management system.

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

The Technical Committee deems that the intended learning outcomes of the Bachelor's degree programmes comply with the engineering specific part of the Subject-Specific Criteria of the Technical Committee 05 – Physical Technologies, Materials and Processes.

The Technical Committee deems that the intended learning outcomes of the Master's degree programmes do not comply with the engineering specific part of the Subject-Specific Criteria of the Technical Committee 05 – Physical Technologies, Materials and Processes.

The Technical Committee 05 – Physical Technologies, Materials and Processes recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
<b>Ba Textile Technology</b>	With requirements	EUR-ACE®	30.09.2025
<b>Ma Textile Technology</b>	Suspension	EUR-ACE® suspended	-
<b>Ma Textile Chemistry</b>	Suspension	EUR-ACE® suspended	-

### **For the Bachelor's degree programme**

#### **Requirements**

- A 1. (ASIIN 1.1) Make the qualification objectives publicly accessible for all relevant stakeholders and ensure that the stakeholders can refer to them.
- A 2. (ASIIN 2.1) Implement rules for the recognition of achievements and competences acquired outside the University (Learning Agreement).
- A 3. (ASIIN 6) Provide a concept for quality management.
- A 4. (ASIIN 2.1) Establish clear and binding regulations for internships, including at which point(s) in the course of study they should be completed.

#### **Recommendations**

- E 1. (ASIIN 1.3) Add modules to the curriculum that teach students about current technological developments in the technical textile industry.
- E 2. (ASIIN 2.1) Introduce measures to support international student exchange (e.g. offer courses in English, establish mobility windows, install an International Office).
- E 3. (ASIIN 2.4) Develop a concept for diversity management.
- E 4. (ASIIN 2.4) Introduce a "compensation of disadvantages" in the study or examination regulations.
- E 5. (ASIIN 3) Increase the percentage that written exams contribute to the final grade.
- E 6. (ASIIN 6) Add questions focusing specifically on textile technology to the graduate survey.
- E 7. (ASIIN 6) Distribute the student and graduate surveys via a third party rather than teaching staff.
- E 8. (ASIIN 2.1) Amend the internship regulations to outline more strongly that the internship company does business in the textile industry and that students improve their practical knowledge related to the subject of study.
- E 9. (ASIIN 2.1) Merge the phases of practical training so that the full industry internship is done in one time period.

### **For the Master's degree programmes**

#### **Prerequisites**

- V 1. (ASIIN 2.1) Improve the academic level of weaving education (both theoretical and practical) to achieve EQF level 7.

- V 2. (ASIIN 3) Ensure that weaving exams reflect the academic level of a Master's degree (EQF level 7).

**Possible requirements**

- A 1. (ASIIN 1.1) Make the qualification objectives publicly accessible for all relevant stakeholders and ensure that the stakeholders can refer to them.
- A 2. (ASIIN 2.1) Implement rules for the recognition of achievements and competences acquired outside the University (Learning Agreement).
- A 3. (ASIIN 6) Provide a concept for quality management.
- A 4. (ASIIN 1.1) Develop distinct qualification objectives for the two Master's degree programmes that describe the academic, subject-specific and professional qualifications gained in each programme.
- A 5. (ASIIN 1.3) Develop distinct curricula for the two Master's degree programmes that clearly reflect the different learning outcomes.
- A 6. (ASIIN 4) Update the equipment in the weaving laboratory.

**Possible recommendations**

- E 1. (ASIIN 1.3) Add modules to the curricula of the degree programmes that teach students about current technological developments in the technical textile industry.
- E 2. (ASIIN 2.1) Introduce measures to support international student exchange (e.g. offer courses in English, establish mobility windows, install an International Office).
- E 3. ((ASIIN 2.4) Develop a concept for diversity management.
- E 4. (ASIIN 2.4) Introduce a "compensation of disadvantages" in the study or examination regulations.
- E 5. (ASIIN 3) Increase the percentage that written exams contribute to the final grade.
- E 6. (ASIIN 6) Add questions focusing specifically on textile technology to the graduate survey.
- E 7. (ASIIN 6) Distribute the student and graduate surveys via a third party rather than teaching staff.

## H Decision of the Accreditation Commission (26.06.2020)

### *Assessment and analysis for the award of the subject-specific ASIIN seal:*

As both Technical Committees' recommendations deviate from the expert panel's final assessment, the Accreditation Commission decides to consult a representative of the peer group. Having clarified that the academic level is questionable only in the discipline of weaving and thus only a subset of teaching contents, they establish that the Master's programmes as well as the Bachelor's degree qualify for the ASIIN seal. Taking into account the high level of motivation within the faculty and the remarkably good support by the University and government, as stressed by the peers, the Commission concludes that MUST can reasonably be expected to fulfil the requirements as recommended by the peers. Therefore they adopt the requirements and recommendations without changes.

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

The Accreditation Commission deems that the intended learning outcomes of the degree programmes comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committees 01 – Mechanical Engineering/Process Engineering and 05 – Physical Technologies, Materials and Processes.

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

<b>Degree Programme</b>	<b>ASIIN seal</b>	<b>Subject-specific labels</b>	<b>Maximum duration of accreditation</b>
Ba Textile Technology	With requirements	EUR-ACE®	30.09.2025
Ma Textile Technology	With requirements	EUR-ACE®	30.09.2025
Ma Textile Chemistry	With requirements	EUR-ACE®	30.09.2025

## **Requirements**

### **For all degree programmes**

- A 1. (ASIIN 1.1) Make the qualification objectives publicly accessible for all relevant stakeholders and ensure that the stakeholders can refer to them.
- A 2. (ASIIN 2.1) Implement rules for the recognition of achievements and competences acquired outside the University (Learning Agreement).
- A 3. (ASIIN 6) Provide a concept for quality management.

### **For the Bachelor's degree programme**

- A 4. (ASIIN 2.1) Establish clear and binding regulations for internships, including at which point(s) in the course of study they should be completed.

### **For the Master's degree programmes**

- A 5. (ASIIN 1.1) Develop distinct qualification objectives for the two Master's degree programmes that describe the academic, subject-specific and professional qualifications gained in each programme.
- A 6. (ASIIN 1.3) Develop distinct curricula for the two Master's degree programmes that clearly reflect the different learning outcomes.
- A 7. (ASIIN 2.1) Improve the academic level of weaving education (both theoretical and practical) to achieve EQF level 7.
- A 8. (ASIIN 3) Ensure that weaving exams reflect the academic level of a Master's degree (EQF level 7).
- A 9. (ASIIN 4.3) Update the equipment in the weaving laboratory.

## **Recommendations**

### **For all degree programmes**

- E 1. (ASIIN 2.1) Introduce measures to support international student exchange (e.g. offer courses in English, establish mobility windows, install an International Office).
- E 2. (ASIIN 2.1) Add modules to the curricula of the degree programmes that teach students about current technological developments in the technical textile industry.
- E 3. (ASIIN 2.4) Develop a concept for diversity management
- E 4. (ASIIN 2.4) Introduce a "compensation of disadvantages" in the study or examination regulations.

- E 5. (ASIIN 3) Increase the percentage that written exams contribute to the final grade.
- E 6. (ASIIN 6) Add questions focusing specifically on textile technology to the graduate survey.
- E 7. (ASIIN 6) Distribute the student and graduate surveys via a third party rather than teaching staff.

**For the Bachelor's degree programme**

- E 8. (ASIIN 2.1) Amend the internship regulations to outline more strongly that the internship company does business in the textile industry and that students improve their practical knowledge related to the subject of study.
- E 9. (ASIIN 2.1) Merge the phases of practical training so that the full industry internship is done in one time period.

## Appendix: Programme Learning Outcomes and Curricula

According to the diploma supplement of the Bachelor's degree programme Textile Technology, the following objectives and learning outcomes shall be achieved by the degree programme:

1. Mathematics and basic scientific knowledge
2. Textile industry raw materials, textile product structure, types, and consumption;
3. Basic knowledge and skills of technology of spinning, knitting, weaving, washing, dyeing, bleaching and finishing;
4. The basic principles of structure, operation, and dashboard of machines and equipment used in textile industry for making yarn, knitting, fabric, dyeing, bleaching and finishing;
5. Knowledge on control and assurance methods of raw materials, product quality, and quality in general and ability and capacity to apply them;
6. Knowledge and ability to carry out technological and engineering calculations of textile materials and products development; and development of new products;
7. Knowledge of modern methods of working in teams on project planning and execution, estimating and processing of project results;
8. Basic knowledge of economics, production industry, capacity and acquirement of conducting estimation and analysis of industrial production indicators;
9. Knowledge of required measurement, ethics, and aesthetic standards for healthy lifestyles and environmental safety;
10. Effective use of spoken and written communication forms and application of written materials in English

The following **curriculum** is presented for the Bachelor's degree programme Textile technology:

**" TEXTILE TECHNOLOGY"  
CURRICULUM FOR BACHELOR DEGREE  
(D072304)**

<b>1A season (autumn):</b>			<b>1B season (spring):</b>		
G.TS101	Introduction to Professional Practice	1	G.TS201	Manufacturing Technology	3
S.MT101	Mathematics I	3	S.MT102	Mathematics II	3
S.CT101	General Chemistry	3	S.CT102	Organic Chemistry	3
S.PH101	Physics I	3	S.ED101	Descriptive Geometry	3
U.IT101	Applied Information Technology I	3	S.CE102	Communicative English	3
S.SS102	History of Mongolia	3	G.TS200	Industrial Practice	1
S.SS115	Human Development	3			
	<b>Elective subjects :</b>	<b>0</b>		<b>Elective subjects :</b>	<b>3</b>
	<b>Total credits:</b>	<b>19</b>		<b>Total credits:</b>	<b>19</b>
<b>2A season (autumn):</b>			<b>2B season (spring):</b>		
S.MS209	Applied Mechanics I	3	G.TSD310	Pretreatment Technology of Textile Fibers and Materials	3
G.TSD203	Textile material science I	3	G.TSD202	Professional General Training II	1
G.TS202	Occupational Safety and Health	2	G.TSD209	Primary Processing Technology Pract	1
S.MT202	Ordinary Differential Equation	3	G.TSD204	Textile Material Science II	3
G.TSD201	Professional General Training I	1	S.PM101	Theoretical Foundations of Economic	3
G.TSD206	Design of Textile Products	3	G.TSD205	Metrology of Textile Materials	2
	<b>Elective subjects :</b>	<b>2</b>		<b>Elective subjects :</b>	<b>6</b>
	<b>Total credits:</b>	<b>17</b>		<b>Total credits:</b>	<b>19</b>
<b>3A season (autumn):</b>			<b>3B season (spring):</b>		
G.TSD301	Spinning Technology I	3	G.TS305	Quality Control in Manufacturing	2
G.TS303	Product Planning and Innovation	2	G.TSD302	Spinning technology II	3
S.PS251	Thermotechnics and Thermodynamics	2	G.TS302	Applied Technology for industrial	2
S.ESP310	English for Specific Purpose	2	G.TSD305	Weaving Technology I	3
G.TSD303	Knitting Technology I	3	G.TS203	Technology, Process Control and	2
			G.TSD304	Knitting Technology II	3
			G.TSD350	Industrial Training I	1
	<b>Elective subjects :</b>	<b>6</b>		<b>Elective subjects :</b>	<b>3</b>
	<b>Total credits:</b>	<b>18</b>		<b>Total credits:</b>	<b>19</b>
<b>4A season (autumn):</b>			<b>4B season (spring):</b>		
G.TS300	Methodology of Research and Study	3	G.TSD309	Industrial Project II (spinning, weaving, knitting)	2
G.TSD306	Weaving Technology II	3	G.TSD390	Bachelor Thesis	5
G.TSD307	Chemical Technology of Textile I	3			
G.TSD308	Industrial project I (spinning, weaving, knitting)	2			
G.TSD351	Industrial Training II	1			
	<b>Elective subjects :</b>	<b>0</b>		<b>Elective subjects :</b>	<b>0</b>
	<b>Total credits:</b>	<b>12</b>		<b>Total credits:</b>	<b>7</b>
				<b>TOTAL</b>	<b>130</b>

According to the diploma supplements of the Master's degree programme Textile Technology and Textile Chemistry, the following objectives and learning outcomes shall be achieved by the two degree programmes:

1. Knowledge of scientific and technological areas of textile industry and future development trends
2. Basic knowledge of the technical and technological theories of each branch of textile industry
3. Application of mathematical planning methods to study textile production technology and to be able to optimize mathematical models
4. Ability to use experimental and measurement techniques in technology and laboratory equipment of textiles and application of modern skills and systems
5. Foreign language skills and abilities to obtain required information from external sources
6. Skills and capacities to communicate with others, debate and solve problems in a logical and analytical way
7. Ability to develop communication skills and application of ethical standards

The following **curriculum** is presented for the Master's degree programme Textile Technology:

MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY SCHOOL OF INDUSTRIAL TECHNOLOGY				
TEXTILE TECHNOLOGY CURRICULUM FOR RESEARCH MASTER DEGREE				
Professional index:	E07230402			
Degree for the professionals:	Master			
Educational level of the entering students:	Bachelor			
Study type:	Day study			
Study time:	1.5-2.0 years			
COURSE CODE	COURSE NAME	CREDITS	PRE-REQUISITE	TERMS
<b>BASIC COURSES OF PROFESSIONAL EDUCATION:</b>		<b>M10</b>		
<b>A. Methodology of research:</b>		<b>M4</b>		
S.CS710	Modeling of Engineering	2		RANDOM
S.IP710	Patent study	1		RANDOM
S.PS710	Methodology of research and study	1		RANDOM
<b>B. Basic theoretical courses:</b>		<b>M6</b>		
I.ST701	Research Methodology for Experimental process	3		RANDOM
I.TI730	Research Seminar I	1		RANDOM
I.TI731	Research Seminar II	1		RANDOM
I.TI732	Research Seminar III	1		RANDOM
<b>PROFESSIONAL TRAINING COURSES:</b>		<b>M15</b>		
<b>A. Core subjects :</b>		<b>M6</b>		
I.TI701*	Textile Material Science III	3		RANDOM
I.TI718	Advanced Textile Fibers	3		RANDOM
<b>B. Elective subjects :</b>		<b>M9</b>		
I.BT702	Material Science and Engineering I	3		RANDOM
I.TC702	Finishing Technology for Textile Materials II	3		RANDOM
I.TI702	Spinning Technology III	3		RANDOM
I.TI703	Weaving Technology III	3		RANDOM
I.TI704	Knitting Technology III	3		RANDOM
I.TI705	Usage of Computer in Textile Industry II	3		RANDOM
I.TI714	Weaving Structure and Design II	2		RANDOM
I.TI715	Knitting Structure and Design II	3		RANDOM
I.TI746	Quality Control and Certification II	3		RANDOM
<b>EXPERIENCE AND RESEARCH WORK:</b>		<b>M4</b>		
S.FL711	Integrated Examination of Foreign languages	1		RANDOM
I.TI720	Research Seminar	3		RANDOM
<b>GRADUATION PROJECT FOR MASTER DEGREE:</b>		<b>M5</b>		
I.TI790	Master Thesis	5		RANDOM
<b>MASTER DEGREE:</b>				
<b>BASIC COURSES OF PROFESSIONAL EDUCATION:</b>		<b>10</b>		
<b>PROFESSIONAL TRAINING COURSES:</b>		<b>15</b>		
<b>EXPERIENCE AND RESEARCH WORK:</b>		<b>4</b>		
<b>GRADUATION PROJECT FOR MASTER DEGREE:</b>		<b>5</b>		
<b>TOTAL CREDITS:</b>		<b>34</b>		

The following **curriculum** is presented for the Master's degree programme Textile Chemistry:

**MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY  
SCHOOL OF INDUSTRIAL TECHNOLOGY TEXTILE CHEMICAL  
TECHNOLOGY  
CURRICULUM FOR RESEARCH MASTER DEGREE**

<b>Professional index:</b>	<b>E07230104</b>		
<b>Degree for the professionals:</b>	Master		
<b>Educational level of the entering students:</b>	Bachelor		
<b>Study type:</b>	Day study		
<b>Study time:</b>	1.5-2.0 years		

  

COURSE CODE	COURSE NAME	CREDITS	PRE-REQUISITE	TERMS
<b>BASIC COURSES OF PROFESSIONAL: EDUCATION:</b>		<b>M10</b>		
<b>A. Methodology of research:</b>		<b>M4</b>		
S.CS 710	Modeling of Engineering	2		RANDOM
S.IP 710	Patent Study	1		RANDOM
S.PS 710	Methodology of Research and Study	1		RANDOM
<b>B. Basic theoretical courses:</b>		<b>M6</b>		
I.ST 701	Research Methodology for Experimental process	3		
I.TC 711	Research Seminar I	1		RANDOM
I.TC 712	Research Seminar II	1		RANDOM
I.TC 713	Research Seminar III	1		RANDOM
<b>PROFESSIONAL TRAINING COURSES:</b>		<b>M15</b>		
<b>A. Core subjects :</b>		<b>M6</b>		
I.TC 702	Finishing Technology for Textile Materials II	3		RANDOM
I.TC 703	Advanced Technology and Transds for Textile Materials	3		RANDOM
<b>B. Elective subjects :</b>		<b>M9</b>		
I.BT702	Material Science and Engineering I	3		RANDOM
I.BT703	Re-engineering for Business Processing	3		RANDOM
I.TC704	Chemical Technology of Protein Fibers II	3		RANDOM
I.TC705	Equipment and Usage for Processing of Textile Industry	3		RANDOM
I.TC706	Structure and Properties of Surface Active Substance	3		RANDOM
I.TI705	Usage of Computer in Textile Industy II	3		RANDOM
I.TI715	Knitting Structure and Design II	3		RANDOM
I.TI746	Quality Control and Certification II	3		
<b>EXPERIENCE AND RESEARCH WORK:</b>		<b>M4</b>		
S.FL711	Integrated Examination of Foreign Languages	1		RANDOM
I.TS780	Research Seminar	3		RANDOM
<b>GRADUATION PROJECT FOR MASTER DEGREE:</b>		<b>M5</b>		
I.TS790	Master Thesis	5		RANDOM
<b>MASTER DEGREE:</b>				
<b>BASIC COURSES OF PROFESSIONAL EDUCATION:</b>		<b>10</b>		
<b>PROFESSIONAL TRAINING COURSES:</b>		<b>15</b>		
<b>EXPERIENCE AND RESEARCH WORK:</b>		<b>4</b>		
<b>GRADUATION PROJECT FOR MASTER DEGREE:</b>		<b>5</b>		
<b>TOTAL CREDITS:</b>		<b>34</b>		