

## Study on the Impact of ASIIN's Programme Accreditation in the Field of Engineering and Management

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### Introduction

ASIIN e. V. was founded in 1999 as a non-profit association for the accreditation of study programmes in engineering, computer science, natural sciences and mathematics. Since then, ASIIN has been conducting accreditation procedures as an international quality assurance agency in Germany as well as abroad. Its national and international objectives are to ensure and strengthen the quality of academic education and to create transparency regarding the quality achieved in higher education in order to promote academic and professional mobility. So far, ASIIN has conducted around 5500 accreditations in Germany and more than 700 accreditations internationally in 43 different countries.

ASIIN is authorised to award a number of different quality seals and labels within the scope of an accreditation procedure or to verify the underlying criteria. First, ASIIN is authorised to award the seal of the German Accreditation Council (AC Seal) to study programmes at German universities. Furthermore, ASIIN has developed its own international subject-specific quality seal (ASIIN Seal) which confirms that a degree programme fulfils the requirements of science and professional practice in a certain discipline to a high level and further validates the provision of a secure set of basic conditions for successful learning and teaching. The award of the ASIIN Seal is based on subject-specific criteria (SSC), which have been developed by the expert committees of ASIIN in cooperation between partners from higher education and professional practice. The SSC reflect the international standard of their respective subject area and comply with the European Qualifications Framework and the "European Standards and Guidelines."

HEIs may also decide to be assessed for one of ASIIN's European subject-specific quality labels: In addition to its own seal, ASIIN is authorized by the European Network for Engineering Accreditation (ENAE) to award the EUR-ACE®-Label for engineering programmes, the Eurobachelor®/Euromaster®-Label on behalf of the European Chemistry Thematic Network (ECTN) for chemistry programmes, the Euro-Inf®-Label for computer science programmes administered by the European Quality Assurance Network for Informatics Education, the AMSE (Alliance of Medical Schools in Europe) label for medical programmes as well as the EQAS Food label for programmes in food science and technology on behalf of the International

Food Association ISEKI. The awarding of these labels demonstrates the compatibility of the respective degree programme with internationally accepted quality standards and at the same time promotes the mobility of students and graduates.

To maintain and further the subject-specific focus of its work, ASIIN relies on a number of external partners and stakeholders, among them ASIIN's institutional members, its board and its expert panels. As a unique feature, ASIIN has established 14 Technical Committees (TC) that cover all fields of study in which ASIIN is active. These committees supervise all accreditation procedures and prepare the decisions of the ASIIN Accreditation Commission for Degree Programmes. In this capacity, they oversee all procedures of their subject area and ensure their equal treatment from a professional perspective. Similar to the composition of the peer groups, each technical committee is composed of representatives from universities, the professional practice, and a student member. The TC discusses all accreditation procedures, which fall within its area of expertise. This includes in particular the discussion of the deficiencies mentioned in the accreditation report as well as a final recommendation of the accreditation decision.

The Technical Committees cover the following areas:

TC 01	Mechanical Engineering / Process Engineering	TC 07	Business Informatics / Information Systems
TC 02	Electrical Engineering / Information Technology	TC 08	Agriculture, Nutritional Sciences and Landscape Architecture
TC 03	Civil Engineering, Geodesy and Architecture	TC 09	Chemistry
TC 04	Informatics / Computer Science	TC 10	Life Sciences
TC 05	Physical Technologies, Materials and Processes	TC 11	Geosciences
TC 06	Engineering and Management, Economics	TC 12	Mathematics
		TC 13	Physics
		TC 14	Medicine

In the following, this study focuses on TC 06. As one of the seven founding Technical Committees, TC 06 has been active for over 20 years solely in the field of Engineering and Management. Since March 2020, the Technical Committee is also responsible for study programmes in economics.

### **Goal of this Study**

Being a full member of ENQA and a member of the European Quality Assurance Register (EQAR), ASIIN carries out its manifold activities in accordance with the European Standards and Guidelines for Quality Assurance (ESG). As per § 3.4 ESG, European accreditation agencies must carry out thematic analyses to "describe and analyse the general findings of their external quality assurance activities". The aim of the following study is therefore to carry out such a thematic analysis as requested by the ESG in order to assess whether the results of ASIIN's activities contribute to systematically improving quality assurance systems of higher education institutions and to identify areas of improvement.

In a study published in 2017, which was based on all ASIIN accreditation procedures carried out in 2017, evidence was provided that an ASIIN accreditation has a positive impact on the quality of the evaluated study programmes. As this study, however, encompassed all 14 Technical Committees of ASIIN, no subject-specific results could be drawn. For example, the quality of laboratories and equipment is of specific importance for the engineering disciplines and the natural sciences while they do not play a dire role in mathematics and informatics degree programme. While the 2017 study thus reflected upon the overall impact of ASIIN accreditations, it was not able to give any subject-specific results. Hence, it was decided to implement impact studies that analyse ASIIN's impact from a subject-specific perspective. This study thus assesses the impact of ASIIN's accreditation procedures conducted within the field of Engineering and Management under the responsibility of TC 06 in the timespan between September 2009 and September 2019.

In order to do so, this study follows a dual approach: In the first part of this study, all accreditations from the field of engineering and management in the defined ten-year period are analysed with regard to their accreditation results. This allows conclusions about the fundamental benefits of accreditation as well as a subject-specific evaluation of accreditation procedures and decisions undertaken in the field of engineering and management.

For this purpose, the individual seals to be awarded (AC Seal, ASIIN Seal, EUR-ACE Label) are compared with each other. The second part of the study deals with study programmes that were accredited twice by ASIIN within the period of the study. The comparison between the results of the initial and re-accreditation allows to determine whether an ASIIN accreditation actually leads to a long-term improvement in the quality of the accredited study programmes. For this purpose, not only the accreditation result as such is consulted but in particular the requirements, insofar assigned, are analysed. The requirements indicate the areas in which the individual accredited study programmes did not or not fully meet the criteria. An analysis of the requirements allow to find out whether there are deficiencies across study programmes and HEIs and to what extent these were addressed in the course of re-accreditation. The comparison of the imposed requirements in the initial and the re-accreditation also makes possible to determine whether the deficiencies found in the initial accreditation were corrected in the long term, which would be proof of the positive impact of an accreditation with ASIIN.

## **Conceptual Basis and Definitions**

The following analysis is based upon the reports of the accreditation and re-accreditation procedures carried out by ASIIN in the field of engineering and management between September 2009 and September 2019. This ten-year timeframe has been chosen for different reasons: Primarily, this timeframe allows for the analysis of a large set of data, which in turn enables specific conclusions about the impact of ASIIN accreditation. Furthermore, the vast majority of accreditation procedures conducted after September 2019 for the award of the AC Seal falls under the premise of a so-called "new accreditation law". Based on a resolution

of the German Federal Constitutional Court of 17 February 2016, the German accreditation law was reformed in essential points and set upon a new legal basis. Essentially, the accreditation agencies are no longer authorised to decide upon the accreditation for the AC Seal; instead, they hand over a report to the Accreditation Council, who makes the final decision. Contracts for accreditation procedures concluded between the university and the agency from 1 January 2018 onwards are subject to this new law. The old accreditation law was still valid for most accreditation procedures concluded until September 2019 as those contracts were signed before 2018; from September 2019 on, the “new law” is predominantly applicable. Since ASIIN does not pronounce the accreditation decision in cases of the “new law”, the impact of ASIIN on the quality of these study programmes cannot be measured. Thus, when referring to the AC Seal in this study, the “old legislation” is always meant.

For clarification, the following definitions will be utilized throughout this study:

- **Accreditation:** Award of a seal/label for a study program after a successful accreditation process and thus a positive accreditation decision. (This also includes suspensions, insofar as they subsequently led to a positive accreditation decision.)
- **Initial Accreditation:** In the case of two successive accreditations of the same study programme, “initial accreditation” marks the first of these two.
- **Re-Accreditation:** In the case of two successive accreditations of the same study programme, “re-accreditations” marks the latter of these two.
- **Accreditation Procedure:** Assessment for accreditation per seal/label per degree programme (If a degree programme is awarded three individual seals/labels, e.g. AC, ASIIN, EUR-ACE, this counts as three accreditation procedures)
- **Seals/labels awarded:** Seals/labels awarded to a degree programme upon a positive accreditation decision. (This also includes suspensions insofar as these subsequently led to a positive accreditation decision).

The first part of this study represents a quantitative assessment of all accreditation procedures in the field of engineering and management under the responsibility of TC 06. The second part of the study focuses on those procedures, which have undergone re-accreditation in the period under review. Particular attention is paid here to the requirements imposed for the accreditation of the individual programmes. Since the AC and ASIIN seals are based upon different criteria, both procedures must be examined separately. The awarding of the EUR-ACE Label depends on the awarding of the ASIIN Seal as the EUR-ACE criteria are fully covered by the criteria of the ASIIN label. Interdisciplinary study programmes, such as Engineering and Management, however, differ in that distinct decisions can be made for the ASIIN Seal and the EUR-ACE Label. This is due to the fact that an Engineering and Management study programme may fulfil the ASIIN SSC of the TC 06, yet the engineering share of the programme may be too small to be awarded the EUR-ACE engineering label.

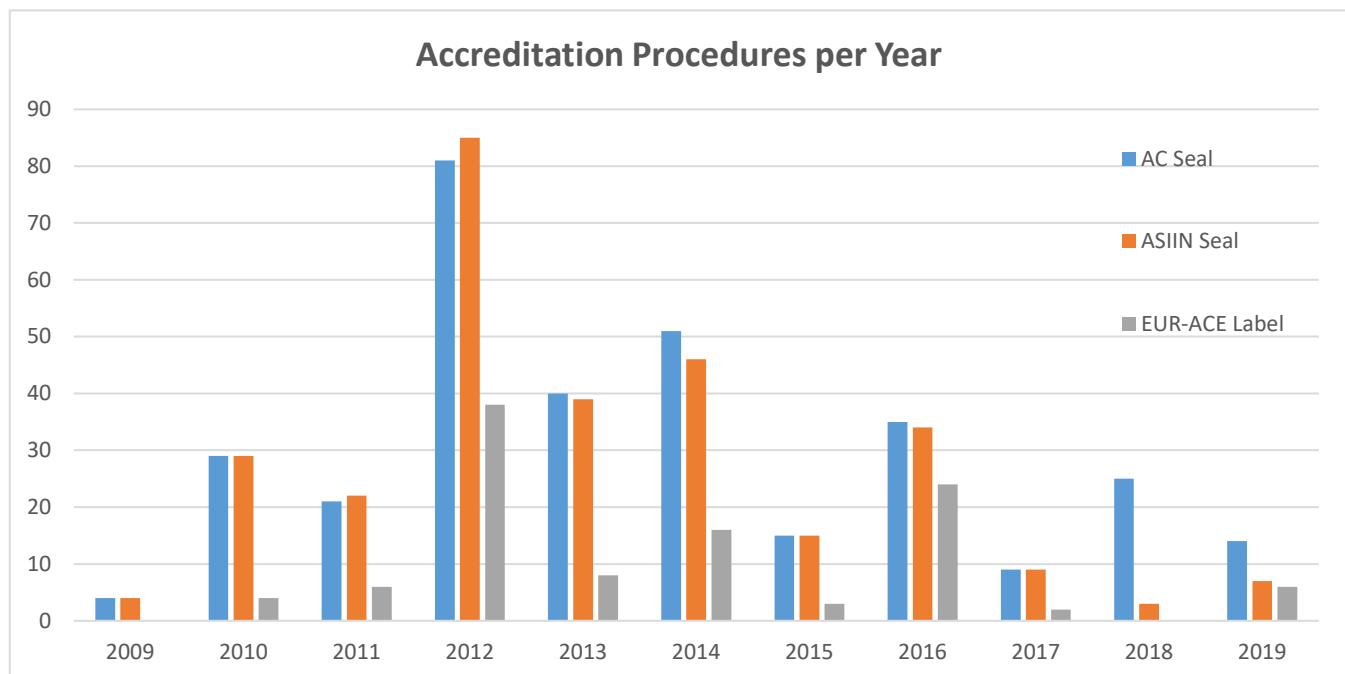
Since several topics are subsumed under each of the individual AC or ASIIN criteria, the criteria for this present analysis were expanded. The eleven criteria of the AC Seal were subsumed into a total of 26 sub-criteria; the six criteria of the ASIIN Seal were divided into 16 criteria. This consideration of sub-criteria is necessary to make differentiated statements about the deficits identified.

## Quantitative Analysis of Accreditation Procedures undertaken by Technical Committee 06 – Engineering and Management

The document analysis was carried out as a structured content analysis of the requirements issues by the ASIIN Accreditation Commission for Degree Programmes. This study is not based upon randomly selected samples but rather a complete survey of all degree programmes that have been assessed by ASIIN in the field of engineering and management between September 2009 and September 2019.

	Total number of accreditations	Involvement of TC 06	in %
All Seals/Labels	6421	724	11,28
AC Seal	2727	324	11,88
ASIIN Seal	2836	293	10,33
EUR-ACE Label	858	107	12,47

As the table above shows, during this ten-year timeframe, the Technical Committee 06 has been involved in 724 accreditation, a total of 11,28% of all 6421 ASIIN accreditation during this time. These numbers can be further broken down to the individual seals: The TC 06 was involved in 11,88% of all accreditations of the AC Seal (324 individual accreditations), in



10,33% of all accreditations of the ASIIN Seal (293 individual accreditations) as well as 12,47% of all EUR-ACE accreditations (107 individual accreditations). With more than 1/9 of all accreditations in this ten-year period and a total of 724 individual accreditations, there exists a large set of data to analyse the influence of the accreditation processes conducted by ASIIN in this area. The following graph lists the number of accreditation procedures per year.

It should further be mentioned that the seals and labels can be awarded either in a joint procedure or separately according to legal specifications. Until 2016, it was possible for ASIIN to award its own technical seal in a joint procedure with the award of the seal of the Accreditation Council. Subsequently, the joint awarding of the two seals was prohibited by the Accreditation Council and the so-called "seal separation" occurred. The separation of seals meant a considerable additional effort for the HEIs since they could only apply for the ASIIN Seal after the AC Seal had been awarded, which led to a significantly lower demand for the ASIIN Seal from 2016 onwards. Since 2018, with the change of the German accreditation law, the conditions for the joint awarding of seals have significantly improved, yet the demand for the ASIIN seal remains small. The award of the EUR-ACE Label, like the award of the other European labels, is linked to the award of the ASIIN label, i.e. the EUR-ACE Label can never be applied for or awarded on its own. Thus, a decline in accreditation procedures for both, ASIIN Seal and EUR-ACE Label can be noted.

### Possible Outcomes of Accreditation Procedures

After the on-site visit is finished, the final assessment by the peers with a recommendation for the decision on accreditation is recorded in form of an accreditation report. This report is then submitted to the relevant Technical Committees of ASIIN to comment on the conclusions of the peer group and the suggested requirements and recommendations. Subsequently, the accreditation report is discussed by the ASIIN Accreditation Commission for Degree Programmes, which decides on the outcome of the procedure and the award of the ASIIN and the European quality seals. Finally, a notification letter with the decision and a copy of the final accreditation report is sent to the university's management.

Accreditation of a degree programme is granted for a limited period. An initial accreditation with one of the aforementioned seals/labels is valid for five years; subsequent renewal is valid for seven years. An accreditation procedure with ASIIN may have the following outcomes:

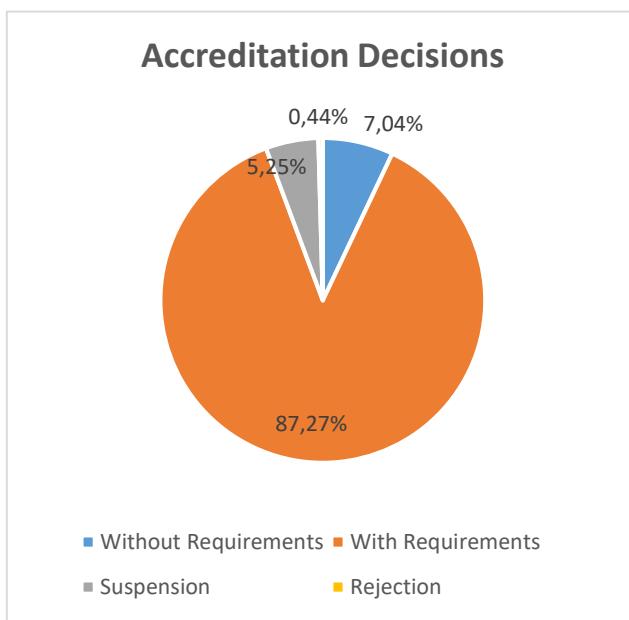
- **Accreditation without requirements** (unconditional accreditation) for the full accreditation period
- **Accreditation with requirements** and thus for a limited period (usually one year). The university has to submit meaningful documents for verifying the fulfilment of requirements in time.
- **Suspension** of the procedure. The procedure can be suspended once if the revealed deficits are so severe that it takes more than one year to resolve them so that no limited accreditation can be awarded. The AC pronounces prerequisites that need to be met by

the university, before the procedure can be resumed.

- **Rejection** of the accreditation if the requirements for the award of a seal/label are not met and the problems identified are so serious that even a suspension of the procedure for a longer period does not seem promising.

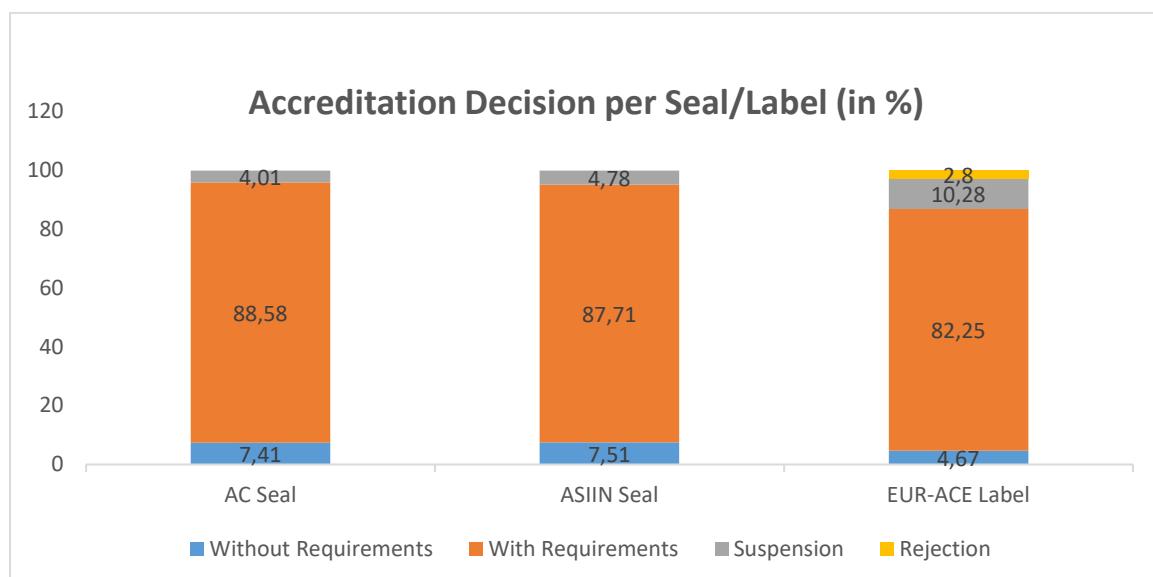
### Results of Accreditation Procedures

As mentioned above, all ASIIN accreditation procedures for degree programmes are discussed by the ASIIN Accreditation Commission for Degree Programmes, which also decides on the outcome of the procedure and imposes prerequisites, requirements, and/or recommendations.



As the chart above shows, most of the accreditation procedures assessed during the allotted timeframe have been accredited with requirements for one year. Only 51 accreditation procedures have concluded in an accreditation without requirements (7,04%), 24 for the AC Seal, 22 for the ASIIN Seal and 5 for the EUR-ACE Label. With 5,25%, 30 procedures have concluded in a suspension and 3 rejected. These rejections all concern the EUR-ACE label and were justified on the grounds that the respective study programmes do not train students to become engineers.

The following graph illustrates the accreditation decisions for the individual seals/label:



First, it can be seen that the share of accreditations limited to one year (with requirements) for all three seals/labels makes up the vast majority of all decisions. The fact that over 80% of all accredited programmes are subject to requirements signals that they must improve in some aspects in order to maintain accreditation. It thus shows that ASIIN impacts the quality of its accredited study programmes.

In general, it is noticeable that the accreditation decisions for both the AC and the ASIIN Seal are similar. For both seals, over 87% of all study programmes have been accredited with requirements, nearly 7.5% have been accredited without requirements and over 4% have been suspended. One reason for this is that the formal criteria of both seals are more or less identical, for example with regard to modularisation or qualification objectives. However, the ASIIN seal also checks the subject-specificity of the study programmes on the basis of subject-specific criteria. The fact that both seals have a comparable decision-making practice in these areas seems to be due to the fact that the ASIIN also assigns subject-specific requirements for the AC Seal, albeit always under the premise of freedom of study and teaching.

In the case of suspension of procedures, prerequisites are laid down in addition to the requirements. These prerequisites must be met before the procedure can be resumed. Examples of such prerequisites show that they cover both formal and substantive deficiencies and that they mostly deal with the insufficient Master's level (EQF 7) of the study programmes to be accredited. For example, one Master's programme was suspended for both AC and ASIIN Seal and had to present "how and where a level is consistently achieved which goes beyond a preceding Bachelor's course of study (deepening of knowledge, expansion of skills and competences, level of the final theses)." Another study programme was given the prerequisite to ensure "that the master's level is achieved", while yet another programme was suspended until the HEI could "prove (e.g. through project work, module descriptions, examinations) that the programme of study is consistently conducted at a master's level."

In comparison to the AC and ASIIN Seal, it is noticeable in the accreditation decisions of the EUR-ACE Label that there are fewer unconditional accreditations (without requirements) (4.67%) but more suspensions (10.28%) and even rejections (2.8%). All three rejections were pronounced because the programmes did not meet the minimum standards of an engineering degree programme as specified by the ENAEE. Although these study programmes train students to become industrial engineers, they focus predominantly on management competencies so that the engineering competences in the programme are not high enough to train these students to become engineers as well. In those cases, the accreditation commission justified the rejection of the EUR-ACE Label by stating that "[the] curricular analysis shows that the majority of the content teach the basics of computer science and business administrations and thus the engineering share is too low" or that "competencies are focused on Management (Logistics) and business issues, so that as a consequence the intended learning outcomes do not comply with the engineering specific aspects.

The higher rate of suspensions, compared to the ASIIN Seal, is also related to the verification

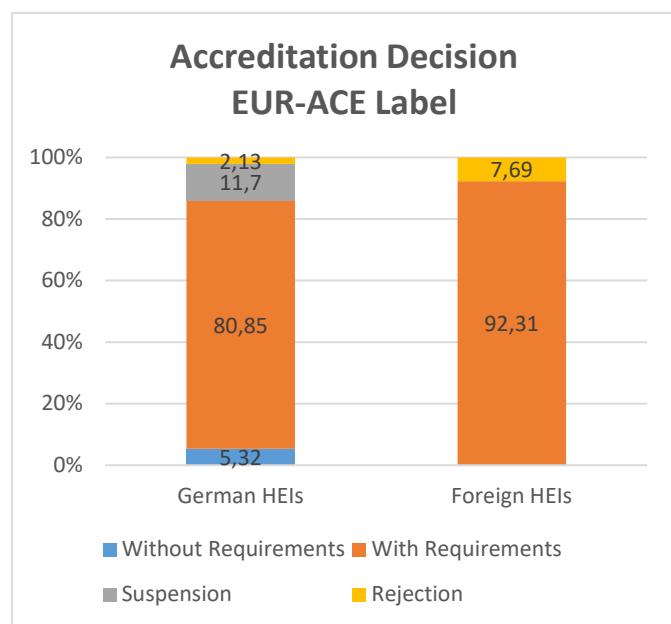
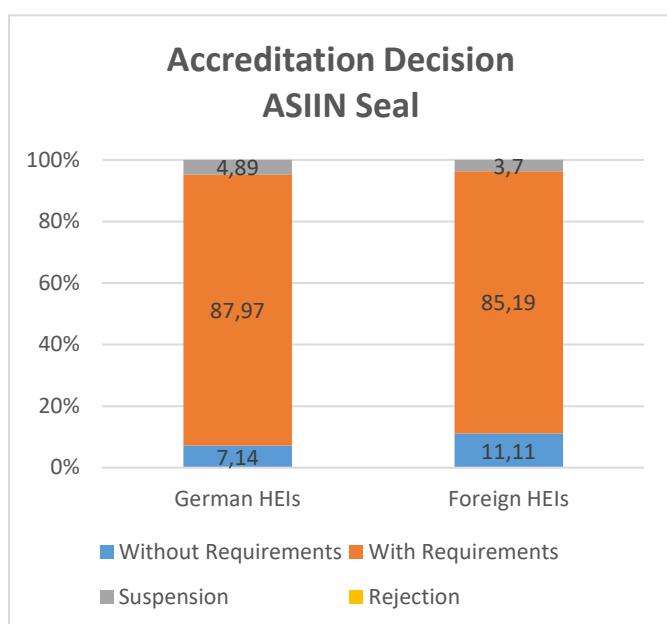
of engineering competencies. In all ten cases where the EUR-ACE Label was suspended while the ASIIN Seal was awarded, the requirements regarding the professional engineering competencies were so severe that the commission decided to award the EUR-ACE Label only after the shortcomings had been remedied. This shows that the ASIIN treats the individual seals or labels according to their different criteria and makes differentiated decisions during the procedures. It also shows the gradation between the individual seals: As a non-subject-specific seal, considerably more degree programmes can obtain the AC Seal than the ASIIN Seal, based on the SSC of the TC 06, and the engineering-specific EUR-ACE Label.

### Comparison German to International HEIs

In the period under review, 30 accreditation procedures in the field of engineering and management were carried out in nine countries, Germany excluded.

Country	Number of Accreditations
Spain	1
Tunisia	2
Australia	6
Austria	2
Peru	1
Finland	12
Northern Cyprus	2
Ukraine	2
China	2

While ASIIN generally is very active internationally, most foreign accreditations are undertaken in the field of natural sciences (biology, chemistry, physics, mathematics and informatics). This distribution differs from the usual focus of ASIIN in Germany, where a large percentage of the assessed degree programmes are engineering programmes. The comparatively low number of international accreditations in the area of engineering and management may be explained with the fact that many foreign universities are rather focused on being accredited by the American Board of Engineering and Technology (ABET) as part of the Washington Accord instead of acquiring the EUR-ACE Label in addition to the ASIIN label.



As the graphs above show, the comparison between the accreditation results of German and foreign HEIs does not initially reveal too great a difference. For the ASIIN Seal, procedures in Germany and abroad result in accreditation decisions with requirements in over 85% of cases. The only noticeable difference here is that foreign universities are accredited somewhat more frequently without requirements and the accreditation is suspended somewhat less frequently. This is rather surprising, as some would expect that in international procedures, especially given the variety of countries ASIIN has been active in, among them some emerging nations such as Peru, Tunisia and Northern Cyprus, the quality of the accredited programmes would lack behind those of the German HEIs. Yet, data show that the opposite was the case.

These findings mirror a concern voiced by the Technical Committees and the Accreditation Commission of ASIIN, namely that different standards are applied in international accreditation procedures. While the ASIIN criteria are the same for both national and international study programmes, it appears as if the auditors judge international HEIs not as strict as they do German ones. While they are motivated by aiding the development process of these HEIs, double standards must nonetheless be avoided. To counteract this, in upcoming accreditation procedures, the auditors should be encouraged to apply the whole spectrum of possible accreditation decisions. For example, suspending an accreditation procedure gives the HEI the opportunity to better the quality of their study programmes over a longer period of time. In this manner, ASIIN can aid international HEIs in improving their study programme while maintaining the minimum requirements for the award of the ASIIN Seal.

The situation is somewhat different for the award of the EUR-ACE Label, even though the data situation here is quite thin with a total of 107 accreditation processes, only 13 of which were undertaken abroad. First, ASIIN has rejected the awarding of the EUR-ACE label both at German and foreign HEIs. Yet the ASIIN Seal, on which the awarding of the EUR-ACE Label is largely dependent, has never been rejected. This exemplifies that ASIIN intensively examines each set of criteria on its own and makes distinct accreditation decisions. It is also noticeable that while there were no unconditional accreditation decisions at foreign HEIs, there were also no suspensions, thus in all cases besides the rejection, the quality of the study programmes was so satisfactory that an accreditation could be granted for an initial year. In contrast, there were 11 German study programmes (11.7%) for which the award of the EUR-ACE Label was suspended.

## **Analysis of Re-Accreditation Procedures undertaken by Technical Committee 06 – Engineering and Management**

As already explained, every accreditation has a certain duration: The first accreditation of a study programme, regardless of the seal/label to be awarded, is valid for five years; every further accreditation has a duration of seven years. Upon expiration of the accreditation, a re-accreditation must take place if the seal/label is to be maintained. In order to measure the

actual impact of an ASIIN accreditation on the quality of a study programme, it makes sense to assess the changes in the study programme over the period of accreditation. For this purpose, all study programmes have been analysed in the following both with regard to their accreditation decision and - if given - their requirements. This makes it possible to verify whether and to what extent ASIIN has secured and improved the quality of study and teaching in the long term and thus fulfilled its own aspirations.

The following analysis thus concentrates on those 57 study programmes in the field of engineering and management that have undergone both an initial accreditation and a re-accreditation by ASIIN in the allotted timeframe of this study. Out of these 57 study programmes, 14 were assessed for both AC and ASIIN seal, 2 programmes were assessed for all three seals/labels, 31 solely for the AC Seal and 6 solely for the ASIIN Seal. The following table thus shows the number of conducted re-accreditations per seal/label: Since only 2 study programmes have been re-accredited for the EUR-ACE Label there is not enough data to conduct a respective analysis. Here, the forthcoming impact study focusing on the field of mechanical engineering, should give more insight into this matter.

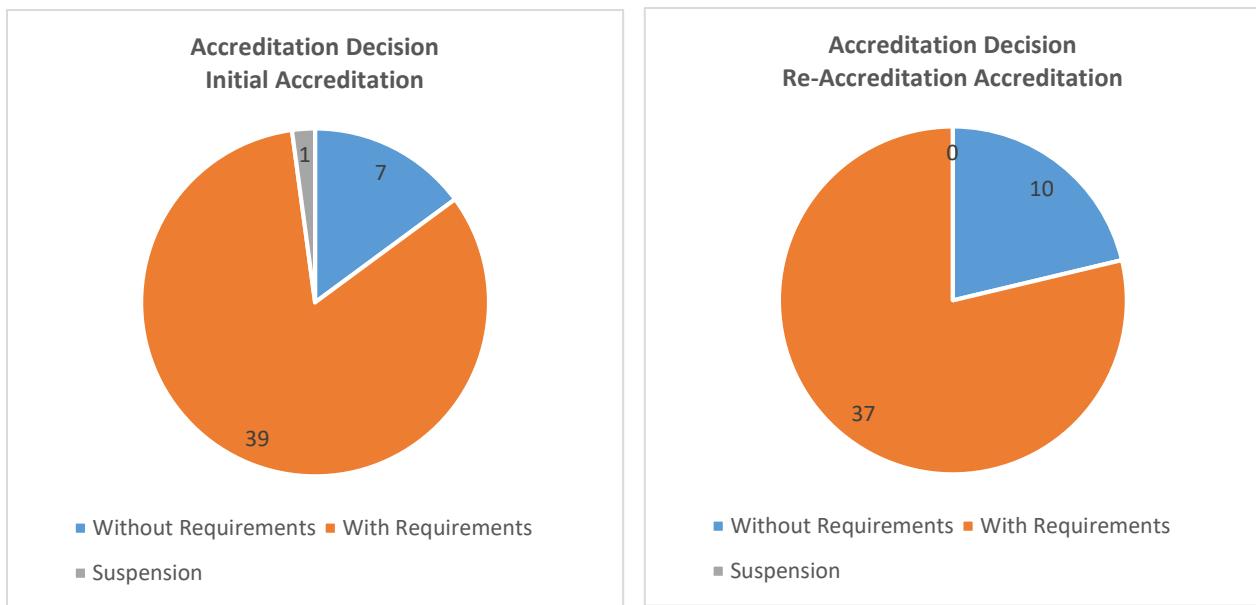
<b>Total Number of Re-Accreditations</b>	71
<b>Re-Accreditation AC Seal</b>	47
<b>Re-Accreditation ASIIN Seal</b>	22
<b>Re-Accreditation EUR-ACE Label</b>	2

At this point, it must be mentioned that significantly fewer German study programmes have applied for re-accreditation for the ASIIN Seal than for the AC Seal. While 82% of all German study programmes had applied for the ASIIN Seal in addition to the AC Seal at the initial accreditation, the proportion was only 47% for re-accreditation. This can be explained by the already mentioned obligation to separate the seals, which makes it more difficult for HEIs to obtain the ASIIN Seal. Moreover, only two international universities (Austria and Finland) have so far undergone the re-accreditation of their study programmes. However, this is due to the fact that most of these study programmes have been accredited for the first time in 2016 or 2017, so their re-accreditation is not due until 2021/2022.

Since the seals each follow their own criteria, a separate analysis of the two seals is carried out below. As the award of the EUR-ACE Label is linked to the award of the ASIIN label, this will not be dealt with separately but together with the ASIIN label.

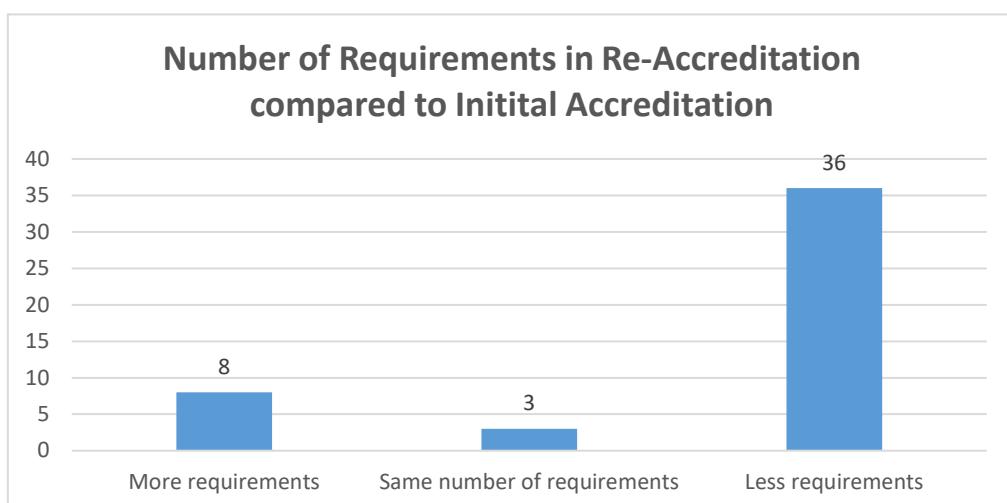
#### **Analysis of Re-Accreditation Procedures – AC Seal**

In the examined period, 47 study programmes have been re-assessed for the AC Seal. The following graphs compare the decision of both the initial and the re-accreditations:



It becomes apparent that the quality of the re-accredited study programmes has improved compared to their initial accreditation: The number of accreditations without requirements rose from 7 to 10 and in the re-accreditation there were no more suspensions, i.e. all programmes were eventually accredited.

Nevertheless, it is noticeable that by far the largest part of the study programmes is still accredited subject to requirements, i.e. there are still criteria that are not or only partially fulfilled. When analysing the data it becomes clear that the number of given requirements is significantly lower in re-accreditation than in initial accreditations. To count the requirements, the conditions in case of a suspension were all treated as requirements. Having said this, during initial accreditations, 182 requirements were formulated whereas in re-accreditation 86 requirements were formulated; in absolute numbers a difference of -96. As the graph below shows, only 8 degree programmes have received more requirements in their re-accreditation than in their initial accreditation while 2 degree programmes received the same number of requirements. Yet for the vast majority of degree programmes, 36, the number of requirements has decreased.



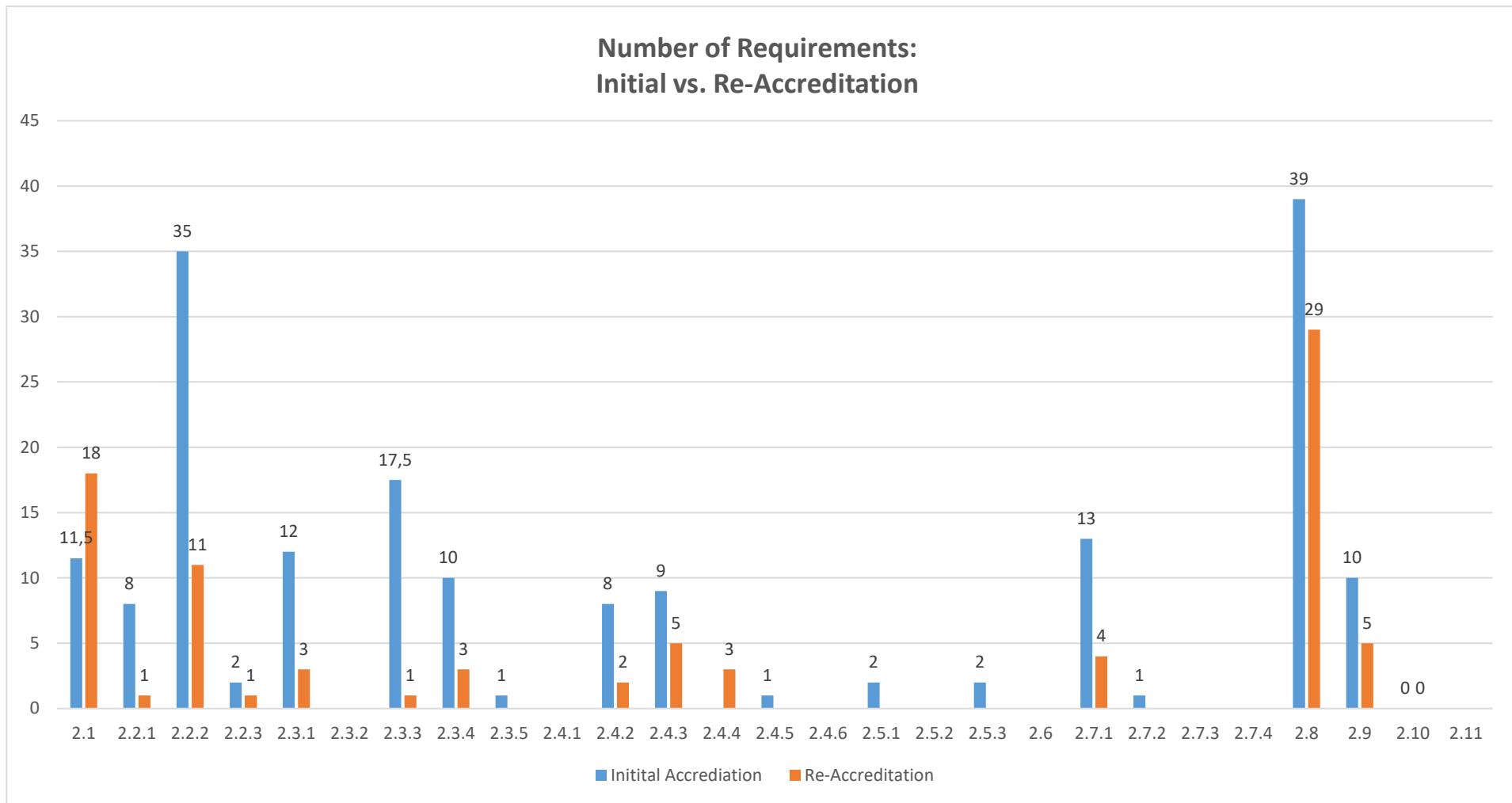
The above findings generally suggests that ASIIN accreditation does indeed improve the quality of an assessed degree programme. However, it is even more revealing to assess which criteria these requirements refer to and to what extent the same criteria were found to be not fulfilled in the initial and the re-accreditation or whether a shift has taken place here.

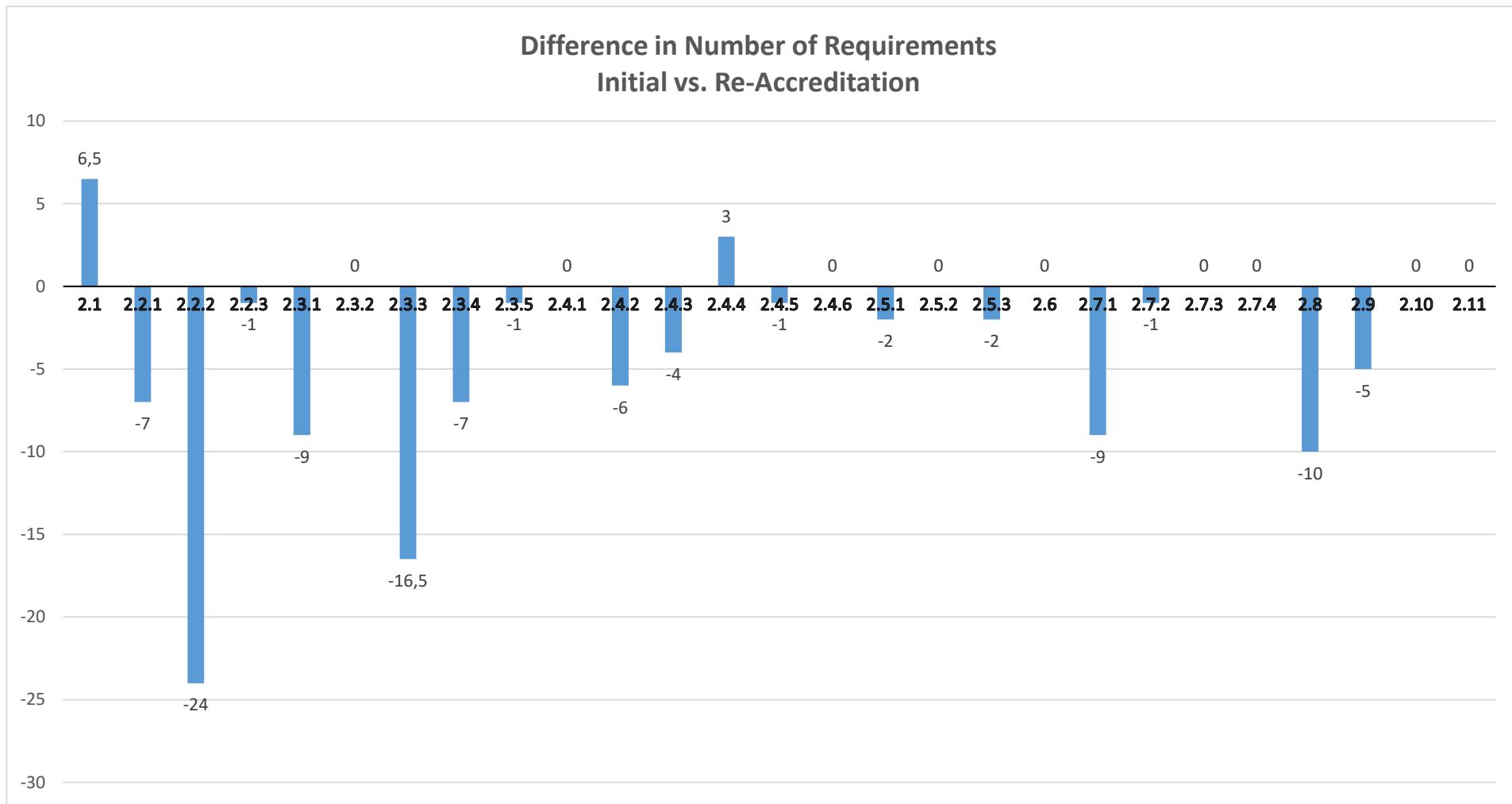
For this purpose, an analysis of the requirements of all re-accredited study programmes that were issued during the initial and re-accreditation was carried out. The criteria for the award of the AC Seal were broken down into further criteria in order to be able to make as precise a statement as possible about the deficiencies that were found.

Below is an overview of the sub-criteria used for this analysis:

Main Criteria (as found in ASIIN documentation)	Sub-Criteria (where applicable)
<b>Criterion 2.1</b> Qualification Objectives of the Study Programme Concept	
<b>Criterion 2.2</b> Conceptual Integration of the Study Programme in the System of Studies	<b>Criterion 2.2.1</b> Admission Requirements and Duration <b>Criterion 2.2.2</b> Module Descriptions * <b>Criterion 2.2.3</b> Other
<b>Criterion 2.3</b> Study Programme Concept	<b>Criterion 2.3.1</b> Curriculum/Implementation of Qualification Objectives <b>Criterion 2.3.2</b> Module Descriptions * <b>Criterion 2.3.3</b> Admission Requirements and Adequate Selection Process <b>Criterion 2.3.4</b> Mobility <b>Criterion 2.3.5</b> Other
<b>Criterion 2.4</b> Academic Feasibility	<b>Criterion 2.4.1</b> Consideration of the Expected Entry Qualifications <b>Criterion 2.4.2</b> Appropriate Curriculum Design <b>Criterion 2.4.3</b> Plausibility of Student Workload <b>Criterion 2.4.4</b> Adequate Frequency and Organisation of Examination <b>Criterion 2.4.5</b> Offers of Support / Course Guidance <b>Criterion 2.4.6</b> Other
<b>Criterion 2.5</b> Examination System	<b>Criterion 2.5.1</b> Exams are knowledge and competence oriented <b>Criterion 2.5.2</b> One exam per module <b>Criterion 2.5.3</b> Other
<b>Criterion 2.6</b> Programme-related Cooperation	
<b>Criterion 2.7</b> Facilities	<b>Criterion 2.7.1</b> Qualitative and Quantitative Human Resources <b>Criterion 2.7.2</b> Material and Spacial Resources <b>Criterion 2.7.3</b> Measures for personnel development and qualifications
<b>Criterion 2.8</b> Transparency and Documentation	
<b>Criterion 2.9</b> Quality Assurance and Development	
<b>Criterion 2.10</b> Special Profile Demand	
<b>Criterion 2.11</b> Gender Justice and Equal Opportunities	

\* The criterion "Module Description" appears both under criterion 2.2 and 2.3. For a better analysis, all the conditions relating to this criterion have been subsumed under sub-criterion 2.2.2; 2.3.2 therefore does not contain any conditions..





	2.1	2.2.1	2.2.2	2.2.3	2.3.1	2.3.2	2.3.3	2.3.4	2.3.5	2.4.1	2.4.2	2.4.3	2.4.4	2.4.5	2.4.6	2.5.1	2.5.2	2.5.3	2.6	2.7.1	2.7.2	2.7.3	2.7.4	2.8	2.9	2.10	2.11
Accr. 1	11,5	8	35	2	12	0	17,5	10	1	0	8	9	0	1	0	2	0	2	0	13	1	0	0	39	10	0	0
Accr. 2	18	1	11	1	3	0	1	3	0	0	2	5	3	0	0	0	0	0	0	4	0	0	0	29	5	0	0
Diff.	6,5	-7	-24	-1	-9	0	-16,5	-7	-1	0	-6	-4	3	-1	0	-2	0	-2	0	-9	-1	0	0	-10	-5	0	0
Diff. %	57%	-88%	-69%	-50%	-75%	0%	-94%	-70%	-100%	0%	-75%	-44%	300%	-100%	0%	-200%	0%	-200%	0%	-69%	-100%	0%	0%	-26%	-50%	0%	0%

At first glance, it is clear that by far the most requirements were imposed in the initial accreditation process for Criterion 2.2.2 (Module Descriptions) and Criterion 2.8 (Transparency). In both cases, these are formal criteria, which can be remedied quite easily by the HEIs. The fact that there are still requirements for these two criteria in the re-accreditation process, albeit less, is due to the fact that modules and their descriptions as well as university rules and regulations are subject to frequent changes. During an accreditation period, modules are added to the curricula of study programmes or their content is adapted. These changes, however, are not always documented in the module descriptions. Regulations and rules of HEIs are also subject to changes during. Here, oftentimes the HEIs initially only submit drafts of regulations for accreditation and the given requirement then targets their publication. Nevertheless, a difference of -69% and -26% respectively is still recorded, showing that there is still a decrease in requirements and thus an overall evolvement in the quality.

If the calculated differences are added, it becomes clear that the number of requirements has increased for two criteria in the re-accreditation (criteria 2.1 and 2.4.4). In all other criteria, the number of conditions has decreased. The difference has remained the same in those cases where no conditions were imposed for both initial and re-accreditation.

Criterion 2.1 (Qualification Objectives of the Study Programme Concept) shows an increase of 6.5 requirements (57% for initial accreditation). This may seem surprising, since the objectives of a study programme should have remained constant over the duration of the accreditation. If one looks at the wording of the imposed requirements, however, it is noticeable that nearly all requirements criticize that “social commitment of the students” is not mentioned in the qualification objectives. According to the criteria of the Accreditation Council, students must not only be prepared for academic and professional qualification but also for a commitment to society as a whole as part of their personal development. The latter aspect has, however, only been intensively evaluated within the last four years. As social commitment of students has not been a criteria in the initial accreditation, this explains the increase in requirements during re-accreditation. Criterion 2.4.4 (Adequate Frequency and Organisation of Exams) – has not been given any requirements in the initial accreditation but three requirements in the re-accreditation. In all three cases, the requirement criticizes the fact that student cannot complete their degree within the standard period of study due to problematic organisation of the exams. Whether students can finish their degree within the standard period of study, however, is an information that the auditors can only gather during a re-accreditation as no such data is available for the time of the initial accreditation.

For all other criteria, the number of requirements in re-accreditation has been reduced. Particularly large reductions can be observed for the following criteria:

- Criterion 2.2.1 (Admission Requirements and Duration): Difference -88%
- Criterion 2.3.1 (Implementation of Qualification Objectives): Difference -75%
- Criterion 2.3.3 (Admission Requirements and Adequate Selection Process): Difference -94%

- Criterion 2.3.4 (Mobility): -70%
- Criterion 2.7.1 (Qualitative and Quantitative Human Resources): Difference -69%

Areas where there has been a reduction in requirements, but not a comparatively large one, are as follows:

- Criterion 2.4.3 (Plausibility of Student Workload): Difference -44%
- Criterion 2.8 (Transparency): Difference -26%
- Criterion 2.9 (Quality Assurance and Further Development): -50%

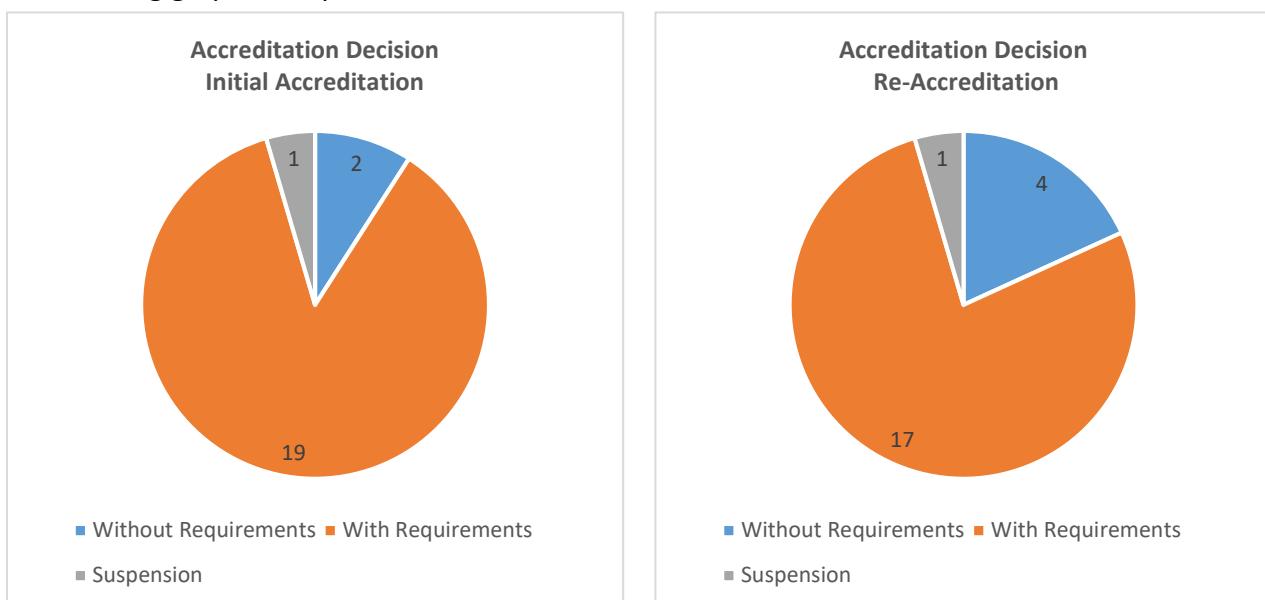
Similar to the module descriptions (Criterion 2.2.1) and the university's regulations, the student workload is also subject to changes over the course of an accreditation period. As certain topics are added or disposed, the workload of a model might increase or decrease. Even if the majority of the study programmes set up an adequate workload, in the course of restructuring the study concept there may be unsuitable workloads, which are discovered and assigned a requirement by the evaluators.

In Criterion 2.9 (Quality Assurance), greater attention has been paid in recent years to the extent to which students are involved in the quality management cycle of their HEI and in particular their degree programme. Here it has become apparent that in some cases, no regular evaluations have been carried out or students have not been informed about the results of the evaluation. Since this is a relatively new criterion, it only comes into play at the time of re-accreditation - similar to the involvement of society as a whole (Criterion 2.1).

Generally, analysing the re-accreditations in the field of engineering and management for the AC Seal shows that accreditation procedures conducted by ASIIN have improved the quality of the evaluated study programmes in these areas in the long term:

#### **Analysis of Re-Accreditation Procedures – ASIIN Seal**

In the examined period, 22 study programmes have been re-assessed for the ASIIN Seal. The following graphs compare the decision of both the initial and the re-accreditations:



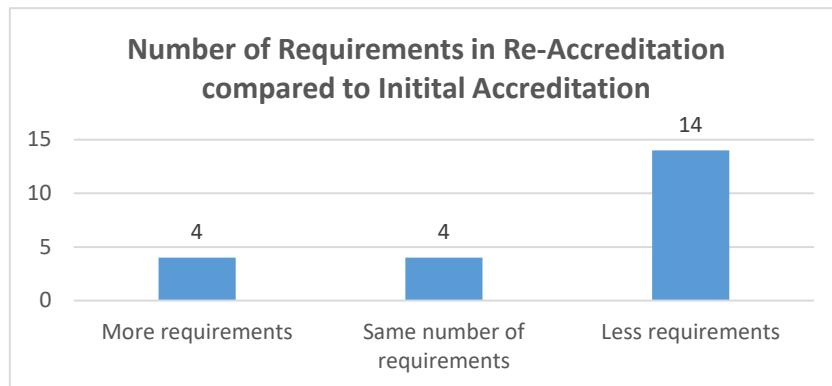
On first glance, it seems that the quality of the re-accredited study programmes has improved only slightly compared to their initial accreditation: One study programme has been suspended and by far the largest share of study programme (77.3%) has been accredited with requirements, i.e. there are still some criteria that are not or only partially fulfilled. If, however, one assesses the individual study programmes instead of the general result of their accreditations, it quickly becomes apparent that there are significant differences between the results of the initial and re-accreditation.

First, the study programme that was suspended in the initial accreditation on the condition that the study concept be revised with regard to the learning objectives and the curriculum, was re-accredited with three requirements. A clear improvement in quality can therefore be determined here. The procedure suspended in the re-accreditation, on the other hand, was accredited in the initial accreditation with requirements. Here, the quality of the study programme has seemingly deteriorated over the accreditation period. If one looks at the recommendations, requirements and prerequisites issued, however, it is noticeable that the prerequisite issued had already been a recommendation in the initial accreditation: Here, the Accreditation Commission recommended "to further implement and develop the quality management system [...] and to use its results for continual improvements of the degree programme". Since this deficiency was not remedied, the Accreditation Commission pronounced the following condition in the process of the re-accreditation: "A quality management system with a closed feedback cycle has to be established." This example shows that the quality of the study programme has not worsened per se, but rather that ASIIN takes into account previously identified deficiencies and follows up accordingly.

When assessing the initial accreditations, 2 study programmes have been accredited without requirements while during re-accreditation this number rose to 4. Of those 4, 3 study programmes were initially accredited with requirements yet were able to improve and become requirement-free in the process. 1 of those 4 had been without requirements in the initial accreditation, thus maintaining its high quality, while the other initial accreditation without requirements was re-accredited with three requirements. In the latter case, the quality of the study programme seems to have deteriorated. However, the HEI states in its self-evaluation report that the study programme had been extensively revised during the course of the accreditation procedure so that eventually a new programme was re-accredited, which explains the increase in requirements.

Nevertheless, it is noticeable that by far the largest part of the study programmes is still accredited subject to conditions, i.e. there are still some criteria that are not or only partially fulfilled. When comparing the data it becomes clear that the number of given requirements is lower in re-accreditations than in initial accreditations. To count the requirements, the conditions in case of a suspension were treated as requirements. In this case, during initial accreditations, 67 requirements were given whereas in re-accreditation 47 requirements were given; a difference of -20. As the graph below shows, only 4 degree programmes have received

more requirements in their re-accreditation than in their initial accreditation while 4 degree programmes received the same number. Yet, for the vast majority of degree programmes, 14, the number of requirements has decreased during their re-accreditation.



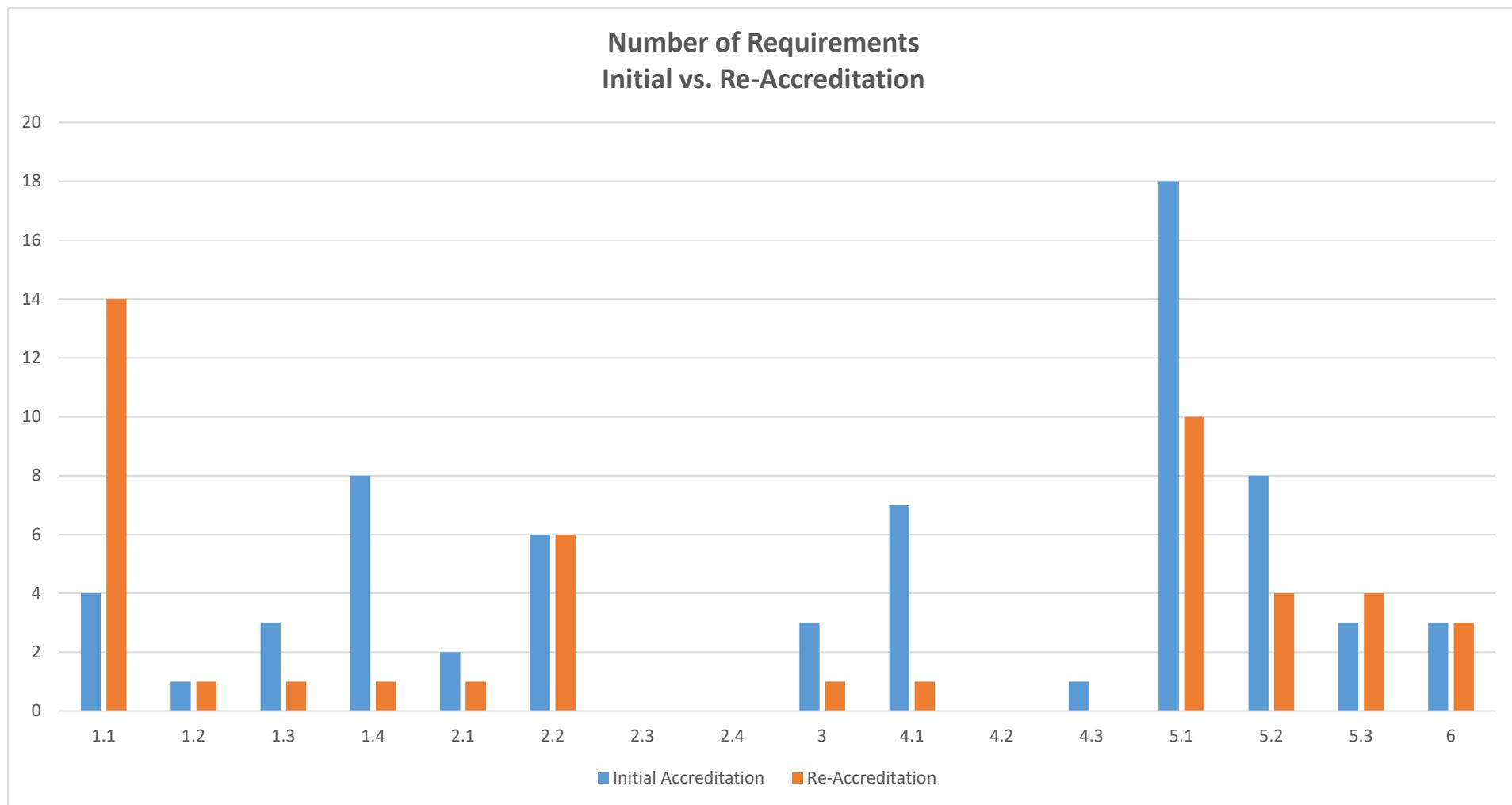
The above finding generally suggests that ASIIN accreditation does indeed improve the quality of an assessed degree programme. Even more significant is whether the given requirements were identical in both initial and re-accreditation or whether a shift has taken place.

For this purpose, an analysis of the requirements of all re-accredited study programmes that were issued during the initial and re-accreditation was carried out.

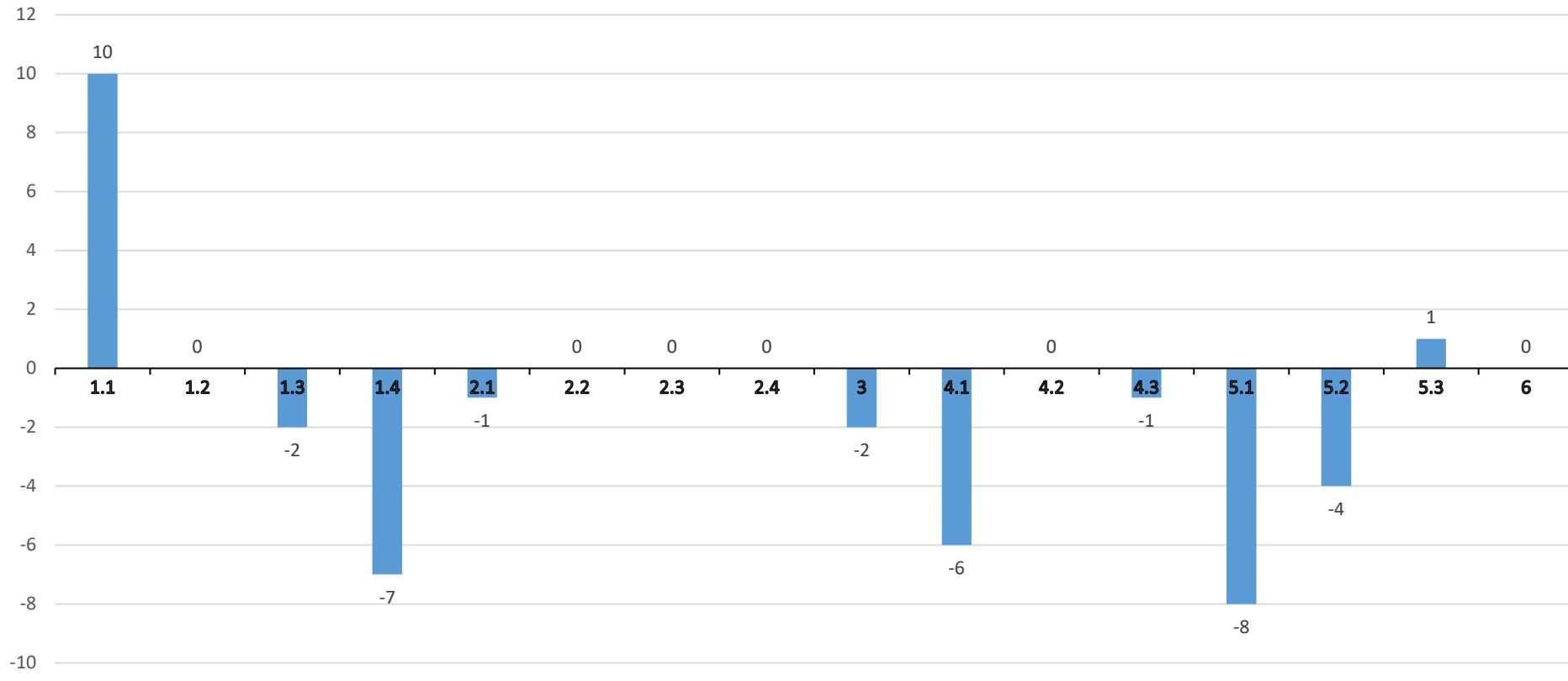
Below is an overview of the ASIIN criteria used for this study:

<b>Criterion 1.1</b>	Objectives and Learning Outcomes of a Degree Programme (Intended Qualification Profile)
<b>Criterion 1.2</b>	Title of the Degree Programme
<b>Criterion 1.3</b>	Curriculum
<b>Criterion 1.4</b>	Admission Requirements
<b>Criterion 2.1</b>	Structure and Modules
<b>Criterion 2.2</b>	Work Load and Credit
<b>Criterion 2.3</b>	Teaching Methodology
<b>Criterion 2.4</b>	Support and Assistance
<b>Criterion 3</b>	Exams: System, Concept and Organisation
<b>Criterion 4.1</b>	Staff
<b>Criterion 4.2</b>	Staff Development
<b>Criterion 4.3</b>	Funds and Equipment
<b>Criterion 5.1</b>	Module Descriptions
<b>Criterion 5.2</b>	Diploma and Diploma Supplement
<b>Criterion 5.3</b>	Relevant Rules
<b>Criterion 6</b>	Quality Management: Quality Assessment and Development

The next page shows a list of all commissioned criteria for both initial accreditation and re-accreditation as well as the calculated difference in requirements.



### Difference in Number of Requirements Initial vs. Re-Accreditation



	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3	4.1	4.2	4.3	5.1	5.2	5.3	6
Accr. 1	4	1	3	8	2	6	0	0	3	7	0	1	18	8	3	3
Accr. 2	14	1	1	1	1	6	0	0	1	1	0	0	10	4	4	3
Diff.	10	0	-2	-7	-1	0	0	0	-2	-6	0	-1	-8	-4	1	0
Diff. %	250%	0%	-67%	-88%	-50%	0%	0%	0%	-67%	-86%	0%	-100%	-44%	-50%	33%	0%

As the graphs show, the number of requirements has increased for two criteria, remained identical for six criteria and decreased for eight criteria in the course of re-accreditation.

Criterion 5.3 (Relevant Rules) showed an increase from originally 3 to 4 requirements. This small increase can be explained by the fact that regulations and other relevant documents change during an accreditation period and that HEIs oftentimes initially only submit a draft of these regulations for the process of accreditation. In these cases, a requirement to submit the published and anchored regulations has been given.

Criterion 2.1 (Objectives and Learning Outcomes) sees a significant increase of 10 requirements (250%). This may seem surprising, since the objectives of a study programme should have remained constant over the duration of the accreditation period. If one looks at the wording of the individual requirements for this criterion, it is noticeable that they almost exclusively criticise the fact that the study objectives have not been formulated in a programme-specific manner or are not publicly accessible. As an example, one requirement reads: "The study objectives and the learning outcomes aimed for in the programme must be formulated specifically for the programme. They are to be made accessible to the relevant stakeholders - especially students and teachers - and anchored in such a way that they can refer to them." In addition, many requirements criticise the fact that the programme objectives are not detailed in the Diploma Supplement. In the interests of continuous further development of the study programmes, it is desirable that the programme objectives be updated. While in the course of changes, errors can always occur, the high increase in the number of requirements in this area (+250%) rather suggests that this criterion – at least with regard to publication and programme specificity – was not adequately followed in the initial accreditation. Here, this criterion should be more explicitly assessed in future accreditations.

For six of the criteria, the number of requirements has remained the same. For three of these criteria (2.3 Teaching Methodology; 2.4 Support and Assistance; 4.2 Staff Development), there were no conditions either for initial accreditation or re-accreditation.

For criteria 1.2 (Title of the Degree Programme) and 6 (Quality Management), there were shifts in each case. This means that other programmes did not meet these criteria at the time of initial accreditation than at the time of re-accreditation.

Of interest is criterion 2.2 (Work Load and Credits), where there are 6 requirements given for both initial accreditation and re-accreditation. The data shows that four study programmes have been given a requirement for this criterion in both the initial and the re-accreditation. When considering the content of each requirement it becomes noticeable, however, that they each target different deficiencies: During the initial accreditation, it was expected that "a standardised calculation basis for workload determination should be applied" for those four study programmes while during the re-accreditation the HEI was asked to make sure that each semester held an average workload of 30 ECTS points. Even in this case, an improvement of the quality can be determined.

For all other criteria, the number of requirements in the re-accreditation has been reduced. Particularly large reductions can be observed for the following criteria.

- Criterion 1.3 (Curriculum): Difference -67%
- Criterion 1.4 (Admission Requirements): Difference -88%
- Criterion 3 (Exams): Difference -67%
- Criterion 4.1 (Staff): Difference -86%
- Criterion 4.3 (Funds and Equipment): Difference -100%

Areas where there has been reduction in requirements but not a comparatively large one are as follows:

- Criterion 2.1 (Structure and Modules): Difference -50%
- Criterion 5.1 (Module Descriptions): Difference -44%
- Criterion 5.2 (Diploma Supplement): Difference -50%

In principle, the decline in the number of requirements of these criteria shows that an accreditation with ASIIN leads to a long-term improvement in the quality of the study programme. In particular, it should be noted that the greatest improvement is to be found in these criteria that focus on the fundamentals of a study programme: curriculum, admission, personnel and material resources. The three criteria, which showed a smaller difference (structure and modules, module descriptions, diploma supplement) are, however, areas which are subject to frequent changes anyway.

## Conclusion

This study has been designed to evaluate the impact of ASIIN's accreditation procedures in the field of engineering and management, under the responsibility of ASIIN's Technical Committee 06 for the timeframe of September 2009 to September 2019. A special focus was placed on the various seals and labels as well as on the quality development of the study programmes in the course of re-accreditation. The following conclusions can be drawn:

1. While 82% of all German study programmes had applied for the ASIIN Seal in addition to the AC Seal at the initial accreditation, the proportion was only 47% for re-accreditation.
2. Even though the different seals/labels are often assessed in a joint procedure, the individual underlying criteria are checked individually. Thus, in some cases the ASIIN Seal was awarded with requirements while the EUR-ACE Label was suspended or even rejected, as certain subject-specific criteria were not fulfilled.
3. More than 80% of all assessed programmes, independent of the seal/label to be awarded, were accredited with requirements. This shows that ASIIN supports the further development of the quality of the degree programmes.

4. No significant differences between German and foreign study programmes could be identified with regard to their quality. As ASIIN works in many countries whose higher education system is still developing, this suggests that international study programmes are evaluated less strict than German ones. To counteract this, in upcoming accreditation procedures, the auditors should be encouraged to apply the whole spectrum of possible accreditation decisions such as suspension of the procedure.
5. In comparison to the initial accreditations, the number of requirements significantly decreased in the re-accreditations, although the majority of degree programmes has still been re-accredited with requirements. For the AC Seal, 76,6% of accreditations received less requirements in their re-accreditation than during their initial accreditation. For the ASIIN Seal, the corresponding figure is 63,6%.
6. During the initial accreditation, most requirements addressed deficiencies with regard to the module descriptions, the curriculum, admission requirements and adequate selection processes, qualitative and quantitative human resources and the transparency of documentation. This shows that many study programmes did not meet the criteria in these fundamental areas and that the ASIIN accreditation revealed these deficiencies, which were then remedied by the respective HEI.
7. During the re-accreditation most requirements concerned deficiencies of the module descriptions and the learning outcomes of the degree programmes. Particularly the ASIIN Seal sees a significant increase in requirements targeting publication and programme-specificity of the learning outcomes in re-accreditation. Here it appears as if this criterion was not assessed substantially during the initial accreditation.
8. The quality of study programmes has improved significantly in the following areas, both with regard to the assessment of the AC and the ASIIN Seal: admission and selection process, implementation of quality objectives, qualitative and quantitative human resources, funds and equipment, mobility of staff and students.