ASIIN Accreditation Report

Bachelor's Degree Programmes
Chemical and Metallurgical Processes (Lima)
Industrial Automation and Electronics (Lima)
Industrial Electrotechnics (Arequipa and Lima)
Plant Machinery Maintenance (Arequipa and Lima)

Provided by
TECSUP

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A About the Accreditation Process

Title of the degree Programme	Labels applied for [1]	Previous accreditation	Involved Technical Committees (TC)[2]
Chemical and Metallurgical Processes	ASIIN, EUR-ACE® Label	26.09.2008 – 30.09.2015	TC 01, TC 09
Industrial Automation and Electronics	ASIIN, EUR-ACE® Label	26.09.2008 – 30.09.2015	TC 02
Industrial Electrotechnics	ASIIN, EUR-ACE® Label	26.09.2008 – 30.09.2015	TC 02
Plant Machinery Maintenance	ASIIN, EUR-ACE® Label	26.09.2008 – 30.09.2015	TC 01
Date of the contract: 14.10.2013 **Submission of the final version of the self-assessment report:** 23.07.2014 **Date of the onsite visit:** 28.-31.10.2014 **at:** Campus Lima and Campus Arequipa			
Peer panel: Prof. Dr.-Ing. Manfred Hampe, Technische Universität Darmstadt; Prof. Dr.-Ing. Michael Klausner, Kiel University of Applied Sciences; Prof. Dr. Bernhard Möginger, Bonn-Rhein-Sieg University of Applied Sciences; Prof. Dr.-Ing. Peter Nauth, Frankfurt University of Applied Sciences; Ing. Miguel Valles, ABB S.A. Peru			
Representative of the ASIIN headquarter: Jana Möhren			

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

[2] TC: Technical Committee for the following subject areas: TC 01 – Mechanical Engineering/Process Engineering; TC 02 – Electrical Engineering/Information Technology); TC 09 – Chemistry.

Responsible decision-making committee: Accreditation Commission for Degree Programmes
Criteria used: European Standards and Guidelines as of 10.05.2005 ASIIN General Criteria, as of 28.06.2012 Subject-Specific Criteria of Technical Committee 01 – Mechanical and Process Engineering as of 09.12.2011 Subject-Specific Criteria of Technical Committee 02 – Electrical Engineering and Information Technology as of 09.12.2011 Subject-Specific Criteria of Technical Committee 09 – Chemistry as of 09.12.2011

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Degree Programmes

a) Name & Final Degree	b) Areas of Specialization	c) Mode of Study	d) Duration & Credit Points	e) First time of offer & Intake rhythm	f) Number of students per intake	g) Fees
Chemical and Metallurgical Processes	--	Full time	6 Semesters 180 ECTS	1989 Summer and winter semester	45 / semester	Between approx. 1670 and 2350 €/semester
Industrial Automation and Electronics	--	Full time	6 Semesters 180 ECTS	1985 Summer and winter semester	45 / semester	Between approx. 1670 and 2350 €/semester
Industrial Electrotechnics	--	Full time	6 Semesters 180 ECTS	1985 (Lima), 1993 (Arequipa) Summer and winter semester	45 / semester (Lima) 44 / semester (Arequipa)	Between approx. 1670 and 2350 €/semester
Plant Machinery Maintenance	--	Full time	6 Semesters 180 ECTS	1984 (Lima), 1993 (Arequipa) Summer and winter semester	45 / semester (Lima) 44 / semester (Arequipa)	Between approx. 1670 and 2350 €/semester

For the degree programme Chemical and Metallurgical Processes, the self-assessment report and the website state the following **programme educational objectives**:

A. Supervise processes, design and develop laboratory tests, highlighting their expertise in chemical engineering technologies.
B. Identify and analyze problems, create and implement solutions with modern technologies.
C. Manage resources effectively; work with initiative, creatively, effectively and in teams.
D. Are professionals committed with quality, environmental protection and safety at work.
E. Are committed with their development and with ethics.

Furthermore the following **programme learning outcomes** are stipulated:

a. Operate and control chemical and metallurgical processes, based on their knowledge of chemistry and unit operations.
b. Apply their knowledge of chemistry, physics, mathematics and technology in chemical and metallurgical processes.
c. Perform chemical analysis and metallurgical tests, and interpret results in order to improve the processes.
d. Design chemical and metallurgical processes with creativity.
e. Work effectively in teams.
f. Identify, analyze and solve technological problems
g. Communicate effectively in oral, written and graphical way.
h. Respect diversity, know contemporary aspects of the profession and practice life-long learning
i. Work with quality and safety, practice environmental protection and demonstrate ethical principles.
a. Manage material and human resources effectively.

The following **curriculum** is presented:

Chemistry and Metallurgy							
MODULAR STUDY PLAN							
ID	MODULES	COURSES					
		SEMESTER 1	SEMESTER 2	SEMESTER 3	SEMESTER 4	SEMESTER 5	SEMESTER 6
QM-01	Chemical Fundamentals	Basic Chemistry	Inorganic Chemistry	Organic Chemistry			
QM-02	Thermodynamics			Thermodynamics			
				Physical Chemistry			
QM-03	Mineral Processing			General Metallurgy	Mineral Processing II		
				Mineral Processing I			
QM-04	Analytic Chemistry				Analytical Chemestry I	Analytical Chemestry II	Environmental Analytical Chemestry
QM-05	Industrial Technology Processes					Industrial Chemistry I	Industrial Chemistry II
QM-06	Applied Technology					Industrial Control and Automation	Environmental Engineering
QM-07	Industrial Operations					Industrial Operations I	Industrial Operations II
QM-08	Chemical Processes				Chemical Processes		
					Food Industries		
QM-09	Metallurgical Processes					Metallurgical Processes I	Metallurgical Processes II
QM-10	Applied Mathematics			Applied Mathematics	Statistics Applied to Laboratories		
QM-11	Fundamental Technology	Electromechanical Workshop	Technical Drawing				
QM-12	Mathematics	Mathematics I	Mathematics II				
QM-13	Physics	Physics I	Physics II				
QM-14	Fundamentals of Electrical Technology	Electricity	Electronics				
QM-15	Values and Culture	Attitudes and Values	National and International Reality				
QM-16	Communications	Communication I	Communication II	Seccessful Presentations			
QM-17	Quality and Safety			Continuous Improvement	Safety, Health and Environment		
QM-18	Basic English					English I	English II
QM-19	Management				Maintenance Management	Project Management	Business Management
QM-20	Human Resources and Labor Market				Decisions Making	Human Resources Management	Induction to Labor Market

For the degree programme Industrial Automation and Electronics, the self-assessment report and the website state the following **programme educational objectives**:

F. Use their solid education in industrial electronics and process control for working successfully in production and service companies.
G. Identify and analyze problems, propose and develop solutions, applying modern techniques and tools.
H. Manage resources and work on teams, with efficacy, initiative and creativity.
I. Are professionals committed to their own development and quality at work.
J. Practice ethical principles that contribute to society advance.

Furthermore the following **programme learning outcomes** are stipulated:

j. Domain and apply knowledge of technology of instrumentation and control.
k. Use modern tools and equipment for industrial processes' instrumentation and control.
l. Apply current knowledge of mathematics, science, technology and engineering.
m. Test measurement and control devices and systems and analyze and interpret results for their application.
n. Design components and systems as solutions to engineering technology problems.
o. Work effectively on teams.
p. Identify, analyze and solve engineering technology problems.
q. Communicate effectively through oral, written and graphic means.
r. Identify the importance of engineering technology in society, and the engagement to continuous professional development.
s. Work with quality and safety; committed to continuous improvement, the practice of ethical principles and respect for diversity.
t. Manage effectively material and human resources.

The following **curriculum** is presented:

ID	Module	COURSES					
		SEMESTER 1	SEMESTER 2	SEMESTER 3	SEMESTER 4	SEMESTER 5	SEMESTER 6
EA1	Electricity Applications	Electrical Workshop	Industrial Electrical Installations				
		Electricity					
EA2	Fundamentals of Chemistry	Chemistry					
EA3	Physics	Physics I	Physics II				
EA4	Mathematics	Mathematics I	Mathematics II				
EA5	Communications	Communication I	Communication II	Successful Presentations			
EA6	Values and Culture	Attitudes and Values	National and International Reality				
EA7	Fundamentals of Technology		Technical Drawing				
			Applied Informatics				
EA8	Industrial Instrumentation			Industrial Instrumentation I	Industrial Instrumentation II		
				Pneumatic and Hydraulic systems			
EA9	Electronic Circuits		Electronics	Electronics Devices and Circuits I	Electronics Devices and Circuits II		
				Digital Circuits			
EA10	Applied Mathematics			Fluid and Heat Technology			
				Applied Mathematics			
EA11	Quality and Safety			Continuous Improvement	Safety, Health and Environment		
EA12	Electrical Installations and Machines				Electrical Machines		
EA13	Automatic Control				Automatic Control I	Automatic Control II	Automation Projects
EA14	Applied Programming				Applied Programming I	Applied Programming II	
						Microcontrollers	
						Programmable Logic Controllers	
EA15	Human Resourses and Job Market				Decisions Making	Human Resources Management	Induction to Labor Market
EA16	Management				Maintenance Management	Projects Management	Business Management
EA17	Power Electronics and Mantenance					Electronic Mantenance	Power Electronics
EA18	Basic English					English I	English II
EA19	Industrial Systems						Industrial Processes and Operations
							Industrial Processes Supervision and Control
							Industrial Data Comunications

For the degree programme Industrial Electrotechnics, the self-assessment report and the website state the following **programme educational objectives**:

A. Develop, implement and maintain electrical systems based on their strong knowledge of electrical installations and power systems.
B. Identify and analyze problems to implement effective solutions.
C. Are professionals with initiative, creativity, and ability for efficient resources management and teamwork.
D. Are professionals committed with their own growth, quality and safety on the job.
E. Apply ethical principles and contribute to the growth of the society.

Furthermore the following **programme learning outcomes** are stipulated:

a. Design, implement and optimize electrical systems using their knowledge of electrical installations and power systems, applying modern techniques and tools.
b. Apply mathematics, science and technology in the design, installation, operation and maintenance of electrical systems.
c. Carry out tests and measurements, analyze and interpret their results in order to evaluate and improve systems.

d. Apply creativity in the design of systems.
e. Work effectively on team.
f. Identify, analyze and solve problems on equipment and systems.
g. Communicate effectively.
h. Recognize contemporary issues of the profession, society and they practice life-long learning and respect for diversity.
i. Work with quality and safety and behave with ethical principles.
j. Manage effectively materials and human resources under responsibility.

The following **curriculum** is presented:

INDUSTRIAL ELECTROTECHNICS - MODULAR STUDY PLAN							
ID	Modules	COURSES					
		Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6
EI-01	Fundamentals of Chemistry	Chemistry					
EI-02	Physics	Physics 1	Physics 2				
EI-03	Mathematics	Mathematics 1	Mathematics 2				
EI-04	Values and Culture	Attitudes and Values	National and International Reality				
EI-05	Fundamentals of Mechanical Technology	Mechanical Workshop	Material Technology Technical Drawing				
EI-06	Fundamentals of Electrical Technology	Electricity	Electronics				
EI-07	Communication	Comunication I	Comunication II	Succesful Presentations			
EI-08	Electrical Metrology			Electrical Measurements Applied Mathematics			
EI-09	Electrical Montage		Electrical Workshop	Electrical Installations Montage and Electrical Installations	Electrical Distribution Network		
EI-10	Electrical Machines			Electrical Machines I	Electrical Machines II		
EI-11	Quality and Safety			Continous Improvement	Safety, Health and Environment		
EI-12	Electronic Circuits			Analog Electronic	Digital Electronic	Power Electronic	
EI-13	Human Resource and Labor Market				Decision Making	Human Resources Management	Introduction to Labor Market
EI-14	Automation and Control				Electrical Control System	Industrial Automation	Process Control
EI-15	Electrical Maintenance				Transformer Maintenance	Electrical Motor Maintenance	Electromechanical Systems Maintenance
EI-16	Energy and Maintenance Management				Maintenance Management	Audit and Energy Efficiency	Electrical Maintenance Management
EI-17	Power Systems					Electrical Power System	Protections of Electrical Power System
EI-18	Basic English					English 1	English 2
EI-19	Management					Project Management	Business Management

For the degree programme Plant Machinery Maintenance, the self-assessment report, the Diploma Supplement and the website state the following **programme educational objectives**:

A. Analyze, design, implement and supervise modern mechanical systems; as well as manage maintenance of industrial plans.
B. Identify problems and opportunities for improvement; implement solutions applying modern technologies and appropriate procedure.
C. Manage resources and work with effectiveness, initiative, creativity, and within teams.
D. Are committed with lifelong learning, quality and safety.
E. Follow ethical principles and they contribute to the growth of the community.

Furthermore the following **programme learning outcomes** are stipulated:

a. Analyze, develop, implement and maintain mechanical and electromechanical systems, using solid knowledge of Mechanical Engineering technologies and modern tools.
b. Apply current and emerging knowledge of science, mathematics and technology.
c. Conduct experiments, analyze and interpret the results and implement improvements.
d. Design mechanical systems, as well as maintenance management systems, applying creativity.
e. Work effectively on teams.
f. Identify and analyze problems, suggest and develop solutions.
g. Communicate effectively.
h. Stay up-to-date on contemporary aspects of the professional, societal and global issues and respect for diversity.
i. Are committed to quality, safety on the job, lifelong learning and ethical principles.
j. Manage material and human resources effectively.

The following **curriculum** is presented:

PLANT MACHINERY MAINTENANCE - MODULAR STUDY PLAN							
ID	Modules	COURSES					
		Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6
MM-01	Fundamentals of Chemistry	Chemistry					
MM-02	Physics	Physics 1	Physics 2				
MM-03	Mathematics	Mathematics 1	Mathematics 2	Applied Mathematics			
MM-04	Fundamentals of Electrical Technology	Electricity	Electronics				
		Electrical Workshop					
MM-05	Values and Culture	Attitudes and Values	National and International Reality				
MM-06	Communication	Communication I	Communication II	Successful presentations			
MM-07	Quality and Safety			Continuous Improvement	Safety, Health and Environment		
MM-08	Basic English					English 1	English 2
MM-09	Management					Project Management	Business Management
MM-10	Human Resources and Labor Market				Decision Making	Human Resource Management	Induction into the Job Market
MM-11	Computer Aided Design		Technical Drawing	Drawing and Industrial Design			
MM-12	Mechanical Design				Design of Machine Elements	Design and Aided Manufacturing	
MM-13	Fluid Power				Pneumatic Systems	Hydraulic Systems	
MM-14	Thermal Machines					Thermal Machines	Refrigeration and Air Conditioning
MM-15	Fluid Mechanics and Thermodynamics			Fluid Mechanics and Thermodynamics			
MM-16	Maintenance Managment				Maintenance Management		Strategic Maintenance Management
MM-17	Industrial Maintenance				Industrial Equipment and Components	Industrial Maintenance	Predictive Maintenance
MM-18	Materials Engineering		Materials technology	Strength of Materials			
				Advanced Materials Technology			
MM-19	Manufacturing Process		Mechanical Workshop	Manufacturing Process	Welding for maintenance		
MM-20	Mechatronics				Industrial Electrotechnics		Industrial Mechatronics Systems

C Peer Report for the ASIIN Seal[3]

1. Formal Specifications

Criterion 1 Formal Specifications

Evidence:

- Self-assessment report
- Website

Preliminary assessment and analysis of the peers:
The formal specifications of the programmes under review are found to be consistent and informative. The preliminary assessment and analysis of the panel throughout this report hold true for the programmes as rolled out at both locations unless explicitly indicated otherwise.

The panel members acknowledged that the study fees depend on the family income and are invoiced progressively. Furthermore, a funding system has been set up under which students can receive scholarships and loans in case they are not capable of paying the fees. About 40% of students currently receive financial support. After graduation, they are expected to pay back their loans so that new students can in turn benefit from payment reductions. The system is designed to be self-financing, taking into account the not-for-profit status of Tecsup.

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

The panel members acknowledged the formerly missing expected intake number for the degree programme Plant Machinery Maintenance. They considered them to be equally suitable as those of the other programmes with regard to the capacities available at the two locations.

The panel considered criterion 1 to be fully met.

[3] 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.

2. Degree programme: Concept & Implementation

Criterion 2.1 Objectives of the degree programme

Evidence:

- Self-assessment report
- Website

Preliminary assessment and analysis of the peers:

The programme educational objectives state in broad terms which competences graduates should have, taking into account professional and academic aspects. The panel considered these to generally correspond to the European Qualification Framework (EQF) Level 6. This assessment will be further detailed in the following sections.

Criterion 2.2 Learning Outcomes of the Programme

Evidence:

- Self-assessment report
- Website Diploma Supplement
- Discussions with representatives of the university

Preliminary assessment and analysis of the peers:

The panel positively noted that the intended learning outcomes as stated in the self-assessment report were also available in Spanish language on the website, as well as – in the example provided – the Diploma Supplement. Additionally, for each of the learning outcomes, performance indicators had been described and were assessed and reviewed within the quality assurance system. In this process, feedback from students, teaching staff and employers were taken into account (see also chapter 6.1).

The programme Chemical and Metallurgical Processes process contains learning outcomes in line with the Subject-Specific Criteria for Chemical Engineering. In particular, they should acquire knowledge and understanding by acquiring sound specialist knowledge in chemical and metallurgical processes as well as chemistry, physics and mathematics. Capacity for engineering analysis, in particular the ability to analyse and assess products, processes and methods is to be found in the performance of metallurgical tests and quantitative chemical analysis as well as the analysis and formulation of solutions to corrosion or environmental solution problems. In terms of engineering design, students shall acquire the capacity to layout apparatus and machinery for chemical processes, for the processing of minerals for metal recovery, and to apply chemical analysis procedures for minerals and their elements. Investigation and assessment skills as well as engineering

practice is to be gained by students' usage of specialist literature which they research in the library as well as carrying out experiments. Students gain engineering practice, in particular the planning, control and monitoring of processes of minerals and metals. They shall also be enabled to develop and operate systems and equipment as well as apply scientific concepts in operations and processes. Furthermore, students are expected to acquire numerous transferable skills, such as the ability to organize themselves, to work in teams and assume specific roles, the ability to use clear written and oral language with professionals and non-professionals, an understanding of the current, social, ethical and environmental aspects of their work and its limits, the interest in lifelong learning as well as applying quality tools and safety rules.

The programme Industrial Automation and Electronics corresponds to the Subject-Specific Criteria for electrical engineering: in terms of knowledge and understanding, graduates shall know the fundamentals of variables of measurements, of industrial instrumentation and control technologies. They shall also understand and use mathematical principals, physical and chemical laws as well as software for simulation and modelling. In the area of engineering analysis, the intended learning outcomes include the ability to conduct tests to instrument and control devices and the analysis and interpretation of controlled processes as well as the ability to configure and control measurement devices, control elements and implement control systems for processes. Engineering design capacities are to be developed in terms of applying creativity to find solutions as well the design of process control and similar systems. Engineering practice and product development are to be achieved through the ability to detect and repair electronic circuits, to identify and solve problems in control equipment and systems as well as the analysis of processes and improvement of control parameters. Furthermore, students need to be aware of current professional and society-related aspects of their work and exert respect for diversity of people. Additionally, they need to be able to commit to lifelong learning and ethical behaviour. Finally, in terms of transferable skills, it is expected that students can work and deliver results and reports as results of team work, communicate with different audiences through different means and apply business management principles.

The peers also assessed the intended learning outcomes of the programme Industrial Electrotechnics against the Subject-Specific Criteria for electrical engineering programmes. They considered the necessary knowledge and understanding of mathematical, scientific and engineering foundations to be reflected in the expectation that students acquire knowledge in calculus, physics, chemistry, electrochemistry and electrical engineering foundations and apply it for the analysis, simulation and operation of electrical systems as well as the maintenance of electrical components. Engineering analysis competence is reflected in the intended ability to execute tests on electrical components,

equipment and systems. Furthermore, students shall be enabled to interpret and analyze results of tests and measurements while applying national electricity codes and standards, all with the aim of enhancing the reliability of electrical systems. The identification of problems using systematic procedures and the proposal of solutions for identified failures in equipment and systems also figure among the expected capabilities. Competences in engineering design are to be acquired in terms of designing electrical installations and systems creatively and the ability to propose creative solutions to specific situations in automation and electrical systems. Students shall gain experience in engineering practice by developing and implementing electrical system projects, selecting materials and equipment from different alternatives and improving existing systems in order to save electrical energy. They shall also be informed of current aspects of their profession, society and staying up-to-date in their speciality. It is expected that students apply quality techniques and tools, work safely and take ethically sound decisions. Intended transferable skills include the capability to communicate effectively through different means of communication, to work in teams and present results of team activities and to apply cost management concepts.

For the programme Plant Machinery Maintenance the panel checked the alignment of the programme learning outcomes with the Subject-Specific criteria for mechanical engineering programmes. Knowledge and understanding of mathematical, science and engineering was included in the programme by means of using physics and chemistry concepts, of applying calculus, basic concepts of fluid mechanics and thermodynamics as well as basics of electrical engineering and machine elements. Students are also expected to be able to analyze, develop, implement and maintain mechanical and electromechanical systems. In terms of engineering analysis, students shall be enabled to test and analyze engineering materials and machines in order to verify their compliance with design requirements and operability. They shall also be able to find and propose solutions to machinery and system problems based on a technical and economic analysis of alternatives. Engineering design competences are to be achieved through the CAD-CAM-CAE based design of mechanisms according to requirements, the design of maintenance management systems and the ability to design and create creative solutions to specific requirements of industrial plants. Investigation and assessment skills are to be developed through the use of technical documentation and its interpretation in connection with the ability to communicate ideas orally and written to different audiences. Students shall also be enabled to plan and schedule activities to eliminate found problems and perform test and regulate operating parameters. Students are expected to gain experience in engineering practice by using equipment and software in practical workshops and laboratory sessions, selecting the appropriate tools, organizing tests, evaluating results and propos-

ing relevant improvement actions. They shall also acquire safety habits and attitudes, apply ethical principles and respect the current debates and limits of their profession as well as its relevance to society at large. Additional transferable skills to be acquired include the compliance with ethical, safety and environmental standards, the ability to assume adequate roles in teams, the use of management principles in human and resource management as well as the readiness for lifelong learning.

While the panel found the intended learning outcomes of all programmes to generally cover all aspects of the relevant subject-specific criteria, and in consequence the EUR-ACE learning outcome statements, they considered them to be very practically oriented. This orientation was also reflected in the teaching methodology and the laboratory activities which students carry out. However, the panel deemed that stronger analytical capabilities should be fostered throughout the programmes (cf. chapter 2.6).

Criterion 2.3 Learning outcomes of the modules/module objectives

Evidence:

- module descriptions

Preliminary assessment and analysis of the peers:

The panel was highly impressed by the module descriptions and their further development since the last accreditation. In particular, they found the learning outcomes to be well written and recognized that Tecsup had carried out annual workshops about the topic of learning outcomes and that the teaching staff was consequently asked to annually update the module descriptions. Bloom's taxonomy was widely made use of.

While the module descriptions are published on the intranet (so called Virtual Campus), they are not accessible externally. The panel considered it important that external stakeholders such as future students, exchange students, and employers would also be able to find details about the objectives and content of the programmes and courses.

Criterion 2.4 Job market perspectives and practical relevance

Evidence:

- Statistics about graduates, working sectors for graduates, employment rates
- List of cooperation agreements with companies
- Description of expected learning outcomes
- Discussions with teaching staff, students, graduates and employers

Preliminary assessment and analysis of the peers:

The programmes under review demonstrate a very close link to labour market requirements. Representatives from the labour market are closely involved in the quality assurance methods for the programmes, in particular through their involvement in the so-called Technical Committees. These committees are set up for each degree programme at each campus and facilitate the feedback of employers about the present curriculum but also about foreseeable needs towards graduates' competences. At the same time, Tecsup emphasised that input does not stem from individual companies pushing for their specific needs but that a balance is reached among industry proposals from different fields. Furthermore, the academic responsibility for the programmes must remain with the teaching staff.

Furthermore, the panel learned that the demand for graduates of all programmes is very high, with many students receiving employment contracts before or upon graduation. Accordingly, employment rate are constantly at over 95%, with a vast majority employed in the mining and construction sector.

Due to the practical relevance of the programmes, two mandatory internships assure that students can apply what they have learned and also get practical experience about working life processes and related expectations in companies. The first internship takes place after the fourth semester and lasts one month. The second internship is implemented during three months after the completion of the sixth semester. The first internship is intended to start the development of a research problem which is later on pursued. Topics are usually provided by the companies but reviewed for suitability by the teaching staff. A member of the staff also visits the companies or plants and discusses the student's performance with the local supervisors while students carry out the internship. The second internship has to be conducted in order to obtain the degree after the completion of the sixth semester. Furthermore, numerous laboratory practices are included into the teaching modules. The peers considered the practical elements to be very well organized and beneficial for the achievement of the programme objectives.

Criterion 2.5 Admissions and entry requirements

Evidence:

- Academic regulations
- Discussion with teaching staff and students

Preliminary assessment and analysis of the peers:
The panel discussed the admission regulations and process with the responsible persons from Tecsup. The panel members learned that the number of applicants is much higher than the available places and that only about 1/3 of candidates in Lima and 1/7 of candidates in Arequipa can actually be admitted. In addition to the general admission test, Tecsup also offers a preparatory course (Technological Aptitude Program, PAT) for those needing additional training, in particular in the field of mathematics. The PAT lasts about 2 months. The panel found that this preparatory course was highly appreciated by students who subsequently passed the admission test. In addition, interviews are conducted with each applicant in order to determine the applicants' motivation as well as to explain the objectives and expectations.

The panel considered the admission process to be very transparent and suitable.

Criterion 2.6 Curriculum/Content

Evidence:

- Curriculum / content overview
- Self-assessment report
- Discussions with teaching staff and students

Preliminary assessment and analysis of the peers:
In general, the panel acknowledged that the curricula of all programmes are very much aligned to the expected demands that graduates will face in their working life, specifically covering practical and functional aspects. The panel valued positively that the curriculum includes numerous projects within the modules, in particular, in the later semesters, which target the integration of several topics and the solution of more complex problems. The projects are usually implemented by small teams set up by the instructors and include prior and final presentations. Instructors then form a jury and question each student in order to grade them individually. The panel considered these projects to be suitable to allow for a direct application of theoretical knowledge.

With regard to the relation between the foundation modules, in particular mathematics, in the first semesters and the subject-oriented technical modules, the peers found room for improvement: while they considered it generally positive that advanced mathematics has been increased in the curriculum since the last accreditation, its link and implementation in the applied engineering modules was lacking. For example, while the Laplace transformation was a part of the advanced mathematics course, it was not applied to system identification in the electrical measurements course which forms part of the same module (metrology). In a similar manner, the peers discovered a necessity that students

understand boundary conditions and requirements in problem solving, for example in control theory. In this context, the panel also considered that the analytical capacities of students should be strengthened. Not least the exercises shown in the laboratories demonstrated that students are encouraged to follow set protocols. The panel also questioned how students were enabled to solve complex problems, e.g. systems with several interdependent components. In electrical networks, for example, students were merely asked to choose among different components which would not constitute a complex task. The argumentation of the teaching staff that students had to follow a process from electrical machinery to power systems to the protection of such systems was not considered entirely convincing.

The question was raised to which extent the programmes are sufficiently advanced to be considered full engineering programmes, or if they are forming an intermediate between an engineer and a technician. It is without doubt that the programmes and the graduates serve the needs of the country and its people at present. Nevertheless, further development of the programmes towards more advanced engineering is essential.

The panel also discussed the extent to which the programmes contained English language elements. Following a request expressed by students, it is planned to implement at least one subject taught in English per programme. Currently, an English language module is included in the curriculum of each programme. The panel learned that the implementation of the module causes some problems at the campus in Arequipa as it is taught outside of the campus requiring students to travel to the location of the language school in the course of their normal studies. This does not appear to be very efficient and should be improved.

The strengthening of English language capabilities is connected to the opportunity for international study exchange which is also highly demanded by students. In order to facilitate such an exchange, the panel suggested the idea of implementing some of the projects in English language. In this way, opportunities for student exchange could work better in both ways as also English speaking students, for example from the partner university in the US, could more easily participate in courses at Tecsup. The advantage of exchanges with the same number of student flows in both directions would be that students continue to pay the fees at their home universities which would mean that Tecsup's students would not have to pay the fees at the partner university (see also chapter 3.3).

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

As the institution did not submit any additional comments, the panel member sustained their preliminary assessment. They considered the criterion to be fulfilled except with regard to the availability of the module descriptions to external stakeholders as they are currently only available on the intranet. They must, however, be also accessible to future students, employers or others.

With regard to some areas of the criterion, the peers found room for improvement in the mid- to long term. In particular with regard to the content and the engineering relevance of the programme, they recommended to base courses more on mathematical and scientific foundations and to ensure that students understand boundary conditions and requirements in problem solving, for example in the field of control theory. Similarly, the panel considered it worthwhile that analytical capabilities should be strengthened throughout the programme.

3. Degree Programme: Structures, Methods & Implementation

Criterion 3.1 Structure and modularity

Evidence:

- Module descriptions
- Curricular study plans

Preliminary assessment and analysis of the peers:

The panel acknowledged that the curriculum is structured into modules which are composed of courses. The modules are rather large entities and some are spread over three semesters. If modules are so long they will hinder the mobility of students, for example when they wish to spend a semester abroad, as credit recognition would be complicated. However, the panel understood from the discussions that the unit which is most commonly understood as standard educational component by teaching staff and students is the course. It was valued that each course is offered every semester, not least as this would facilitate retaking in case of failure. It was not quite clear whether, in practice, credits were awarded after the completion of the course or of the module. Tecsup representatives explained that all courses were completed with exams. The peers also noticed that educational components consist of several teaching units such as lecture and corresponding project and/or laboratory session. It might be worthwhile for Tecsup to align

their wording with the forthcoming ECTS Users' Guide 2015 in order to make it more transparent to other higher education institutions in the European Higher Education Area.

Criterion 3.2 Workload and credit points

Evidence:

- Self-assessment report
- Discussions with students

Preliminary assessment and analysis of the peers:
Tecsup applies a system of national credits in line with national higher education laws. In order to facilitate the mobility of its students and transparency of its degrees, ECTS credits are additionally calculated and indicated, for example in the module descriptions and the diploma supplement. The panel questioned the basis for calculation of the ECTS credits and learned that surveys had been carried out among students and teaching staff. While students generally confirmed their satisfaction with the workload, it appeared to be comparably high. The peers therefore did not find any need for immediate changes but encouraged Tecsup to carefully monitor the workload of the students in the frame of the quality assurance system. Furthermore, they pointed out that ECTS credits are based on 60 minutes per hour, irrespective of local course duration. It should be noted that in line with Peruvian regulations, the thesis is drafted after the completion of the sixth semester. It is thus not part of the workload encompassed by the credit point system which applies only to the six semesters spent at Tecsup. While this practice is not fully comparable to the calculation of workload in the EHEA, the panel considered it to be sufficiently transparent for all involved stakeholders in Peru, in particular students.

The panel also noted that rules for the recognition of credits acquired externally are in place despite the possible difficulties with modularisation (see 3.2) and the fact that currently few exchanges take place (see chapters 2.6, 3.3).

Criterion 3.3 Educational methods

Evidence:

- Module descriptions
- Discussions with teaching staff and students

Preliminary assessment and analysis of the peers:
The educational methods include several elements appreciated by the panel. In particular, the small class sizes and the numerous projects which supported the direct application of knowledge and thereby the acquirement of the intended learning outcomes. In

this context, the high degree of motivation and dedication of the teaching staff to their educational mission also facilitated the good conditions for teaching and learning.

The panel discussed the use of modern teaching methods with the staff members. While they noted that a Virtual Campus was provided where staff members updated course information and exercises, some efforts towards live online transmission were also made.

The peers questioned the lack of elective modules in the curricula. They recognized that Tecsup had designed the curricula of all programmes in a very dense manner which would not allow the replacement of any mandatory modules. However, in order to allow students for some additional individual development, visiting lecturers and joint conferences with other Peruvian universities were organized. Students were also encouraged to participate in student challenges and seminars.

In the context of enhancing the English language elements in the programmes (see section 2.6), the panel also discussed ideas such as providing English summaries of teaching material, developing glossaries, giving summaries of last lesson in English, or making use of English language textbooks. All such activities would cater to the explicit wish from the students to have more opportunities for international exchange which was supported by the peers.

Criterion 3.4 Support and advice

Evidence:

- Self-assessment report
- Discussions with teaching staff and students

Preliminary assessment and analysis of the peers:
The supervision, support and advice of students were considered by the peers to be one of the strong points of the teaching and learning process at Tecsup. In particular, the close supervision and monitoring of the students was adequate to facilitate the progress of students and completion of the programmes. The peers recognized that students who had failed more than two modules were not allowed to progress to the next semester but were enabled to concentrate on the failed modules (see also chapter 4). The failure rates in the first years were between 25 – 30 % with peaks in the modules mathematics and physics. Tecsup offered supporting courses in order to lower the rates to 20%. Tecsup also uses a “traffic-light” system in which those students are marked who are likely to fail a course based on their intermediary results. Tutors will then provide special advice to the students in order to better prepare them for the remaining tasks. This close monitoring was considered by the panel to be an effective means of avoiding drop-outs.

A large emphasis in supporting students was put on preparing students for working life. The panel positively noted that the curriculum included mock interviews, discussion training and project management.

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

The panel fully confirmed its preliminary judgment as not comments were received from the institution. While the panel members considered the criterion as a whole to be fulfilled, they recommended a few areas for enhancement: Firstly, in order to be in line with European terminology, in particular when dealing with European institutions, the programme structure could be made clearer by re-considering the definition of "module" in alignment with the ECTS Users' Guide. With a view to the workload of students and the high number of expected hours, the peers also recommended monitoring it in the frame of the quality assurance mechanisms already under way. Finally, also aimed at facilitating the intended internationalization, the peers considered that several measures for increasing the English elements in the curricula would be helpful, for example the provision of English summaries of teaching material, textbooks or glossaries, asking teaching staff or students to give summaries of last lesson in English, or simply introducing the English modules earlier in the curriculum.

4. Examination: System, Concept & Implementation

Criterion 4 Exams: System, concept & implementation

Evidence:

- Academic regulations
- Discussions with teaching staff and students

Preliminary assessment and analysis of the peers:

The panel discussed the exam types in use with the teaching staff and students. The module descriptions contain information about the continuous and final exams for each course, for example quizzes, lab reports and written exams. The panel recognized that oral exams are also part of course exams, as are presentations, in particular for the course projects. The latter are used to be able to grade each student individually in the case of group projects. The students confirmed that they receive information about the evaluation types of each course at the beginning of the semester, usually contained in the syllabus. The teaching staff is in the process of developing an exam question data base sourcing from previously used exam questions. The panel questioned whether students would

have access to such question catalogues as this would increase the risk of learning for the mere purpose of passing. The peers were, however, satisfied that staff members would regularly modify and re-write questions. Overall, the panel considered the exam types in use to be sufficiently varied and suitable to assess the achievement of intended learning outcomes.

The weighting of the different exams within a module are specified in the syllabus and in the academic regulations. The grading system ranges from 0 to 20 with 11 as the minimum passing grade. Students who have failed a module but received a grade above 8 are allowed to participate in a make-up exam. The panel considered the examination system to be fair and transparent. More specifically, they considered the modalities allowing students who failed a module to repeat it but at the same time ensuring that students who have failed more than one cannot proceed to be supportive and fair. The exam organization overall was considered to be transparent.

The final thesis is composed after the completion of the sixth semester. Typically, it is connected to the final internship and thus developed within a company. Tecsup teaching staff members are responsible for reviewing the planned topic and act as supervisors. Students must defend the thesis before a public jury. The peers considered the described practice to be suitable.

During the onsite visit, the panel observed several examples of exams and final thesis. While the level detected varied somewhat among the modules and programmes, overall the panel concluded that they corresponded to the required level and demonstrated the achievement of the intended learning outcomes.

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

The panel made no alterations to its original assessment of this criterion, namely that it was fulfilled with regard to exam organisation, methodology and implementation.

5. Resources

Criterion 5.1 Staff involved

Evidence:

- Staff handbook
- Discussions with teaching staff

Preliminary assessment and analysis of the peers:
The panel recognized that the educational mission was at the forefront of all instructors' activities. They also considered that the sense of ownership and cooperation among teaching staff was laudably very high. There is a general strategy to increase the number of full time staff in line with increasing student numbers and the opening of new programmes. With regard to the instructors' qualifications, the panel noted the efforts made by Tecsup to implement one of the recommendations from the first accreditation: namely, to increase the number of Master and PhD degree holders. The peers acknowledged that the mid- and long-term strategy of Tecsup included the continuous augmentation of staff qualification with recent new requirements for higher degrees for newly hired instructors. While a good progress had been made in the last six years, the panel still recommended further raising the number of Master and PhD degree holders. This would be in line with the explicit wish of instructors to pursue further education and easier access to them. Though staff members generally did feel that the management was supportive, any further advance would be appreciated.

With regard to the research activities of the instructors, these are rather limited. A few applied research projects are carried out in cooperation with companies or with the University of Engineering and Technology. Instructors are rather more involved in consulting activities. This is a particular incentive for part time teaching staff in order to attract them more continuously to Tecsup. It also positively influences the connection of staff to current development and use of new technologies in their field.

Criterion 5.2 Staff development

Evidence:

- Capacity development offers / Further education
- Discussion with teaching staff

Preliminary assessment and analysis of the peers:
In line with the above considerations, the panel considered that Tecsup staff members principally have access to and make use of further education offers. An additional aspect considered by the panel was the increase and facilitation of international mobility not only for students but also for staff members. Taking into account the already existing offers for English language training, these could be further enhanced by allowing teaching and training exchange with international higher education institutions.

Further emphasis is put on the didactical capabilities of instructors. In particular, teaching staff has to adapt to different learning realities of students in terms of online, blended

and ICT-based learning. Laudable efforts were made in setting up mechanisms for online transmission of lectures.

Criterion 5.3 Institutional environment, financial and physical resources

Evidence:

- Self-assessment report
- Visit of laboratories at both campuses
- Discussions during the visit

Preliminary assessment and analysis of the peers:
Concerning the physical and financial resources the panel members gained the impression that the teaching facilities and infrastructure available to students were highly suitable at both locations. They noted, however, that the coverage and access to the Wi-Fi system in Arequipa could be improved, as students currently only have access to the internet using the computers in the library. While students can use the necessary software, such as MATLAB, on the computers in the labs, it does not seem to be common practice for students to buy student versions of software and use it on their personal devices. The usage of Aspen Plus software would be additionally beneficial in the programme Chemical and Metallurgical Processes. In order to allow students to enhance their scientific work capacities, increased and easier access to databases, journals and state-of-the-art software would be considered favourable by the panel.

The panel acknowledged that the laboratories used for the modules were very well equipped and well organized. The technical staff in the labs demonstrated a high degree of expertise and responsibility. Occupational safety and health standards were applied in all laboratories visited.

Financial resources stem principally from the study fees with additional income from the consulting activities. All income is collected in the central budget which is in turn spent, according to a mid- and long-term investment plan on improving the study conditions and equipment, staff salaries and new student loans. The panel considered the financial strategy and the resources available for the programmes under review to be very sound.

In terms of external collaboration, the panel noted that Tecsup has very close links to Peruvian companies. These are utilized in a three-fold way: firstly, industry representatives participate in the quality assurance and further development of the degree programmes (see also section 6, below), secondly, for recruiting (part-time) teaching staff, and thirdly in the form of consulting activities. All these activities aim at ensuring that the compe-

tence profiles of graduates and the curricula meet the relevant requirements of to the labour market in the country.

As to international collaboration, the panel considered this an aspect to be improved. While currently only two agreements exist with higher education institutions outside the country (USA, Brazil), both teaching staff and students expressed a high level of interest in furthering exchange. The panel strongly encouraged such endeavours in order to strengthen the international relevance of the programmes. They pointed out that reciprocal exchange was of prime importance so that students and staff in Peru would also be able to benefit from input from international students or teachers.

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

As no comment was received from the institution, the panel sustained its initial assessment. While the criterion was considered fulfilled, the panel identified a few areas for improvement. In particular with regard to the qualification of teaching staff in regard of the needed further development of the programmes, the peers recommended to further raise the number of Ma and PhD holders as well as to facilitate current teaching staff obtaining a higher degree and/or participating in international mobility activities. In the context of the desired internationalization, the number of agreements with international HEIs would also have to be increased in order to allow more students to participate in exchanges. The panel emphasized the need for reciprocal exchange in this context.

As regards the resources available for students, the panel recommended providing them with more access to databases, journals and state-of the-art software such as AspenPlus, for example.

6. Quality Management: Further Development of Degree Programmes

Criterion 6.1 Quality assurance & further development

Evidence:

- Self-Assessment report
- Minutes of Meetings of Technical Committees
- Results of measurements of PEO achievement and surveys
- Discussions during onsite visit

Preliminary assessment and analysis of the peers:
The quality assurance management system of Tecsup is set forth in the so-called Continuous Improvement Plan (CIP). The system includes an assessment phase, evaluation activities and subsequent action plans. During the assessment phase, surveys of students, graduates and employers as well as additional interviews and consulting of the Technical Committees are carried out, all targeted at verifying whether the programme educational objectives, intended learning outcomes and course objectives have been achieved. The panel particularly recognized the role of the Consulting Technical Committees mentioned elsewhere in this report. The industry contribution to the design of the curricula and serious reflection on the further development of the programmes were deemed exemplary.

The peers also noted the clear orientation towards programme objectives and learning outcomes in the surveys and evaluation stage as laudable efforts. They found that the responsible committees as well as the teaching staff members themselves attempted to clearly link their activities, based on the results of surveys and performance criteria, on the achievement of the intended graduates' competences. Several surveys were carried out among students to encompass all aspects of teaching and learning. However, the panel discovered that not all feedback loops had been closed yet: students were not informed about the results of surveys. While it was laudable that surveys were carried out after about 2/3 of the semester so that possible improvements could yet be implemented during the running semester, there was only indirect feedback to students. They would only implicitly notice whether their feedback had any consequences when, for example, a teacher would no longer be employed. An element of quality management currently in use and aimed at involving all stakeholders of the institutions are annual award ceremonies for best teacher per department, best researcher, best tutor etc. These awards are based on the results of surveys and interviews.

Criterion 6.2 Instruments, methods and data

Evidence:

- Self-Assessment report
- Minutes of Meetings of Technical Committees
- Results of measurements of PEO achievement and surveys
- Discussions during onsite visit

Preliminary assessment and analysis of the peers:
A general internal review of the programmes is carried out every three years with input from all locations where they are offered. Any changes made in the meantime must also be made jointly and are facilitated by a continuous communication between the

branches. As the panel acknowledged the extensive data is available for these continuous reviews to the relevant Tecsup committees concerning students' progress, grade distribution, and failure and success rates. Data was collected per programme and collated to commentaries from the faculty, evaluation department as well as improvement actions. The panel gained the impression that the data collected as well as the results from surveys and interviews were useful for the responsible entities to gain information about students' progress within the programme, and importantly about the status of achievement of the intended learning outcomes. To this regard, learning outcomes portfolios have been developed bringing together performance criteria, assessment plans, assessment tools and improvement proposals. The course execution reports drafted by the instructor based on this data are then submitted to the programme committee responsible for identifying and checking up on improvement actions.

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

The panel considered the criterion to be completely fulfilled. However, the institution should take care that students are systematically informed about the results of surveys in order to close feedback loops also in this regard.

7. Documentation & Transparency

Criterion 7.1 Relevant Regulations

Evidence:

- Academic Regulations

Preliminary assessment and analysis of the peers:
In the view of the panel, the Academic Regulations encompass all key stipulations for admission, operation of the programmes and graduation. They have been subject to a legal check, are in force and accessible for consultation.

Criterion 7.2 Diploma Supplement and Certificate

Evidence:

- Diploma Supplement Bachelor Plant Machinery Maintenance

Preliminary assessment and analysis of the peers:
The sample diploma supplement was considered to be suitable for providing information about the objectives, intended learning outcomes, structure and level of the degree. In-

formation about the individual performance was available in the Study Certificate (Certificado de Estudios). The panel asked that a sample of an actual, filled in Diploma Supplement should be provided to them. In doing so, Tecsup should take care that each page was signed or otherwise ensured that no fraud could be committed with the document. The peers also pointed out that statistical data about the grade distribution should be included so that external readers could understand the value of the grade achieved. Further information on grade distribution can be found in the ECTS Users' Guide.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 7:

The panel assessed the samples of the Diploma Supplement for each degree programme. They considered them to be vastly suitable. With regard to the information of the final grade, the panel noticed that while general information was provided about the ranking of different grades, no statistical data was included demonstrating how many students actually received each of the relative grades. The provision of such statistical data contains a rough classification showing the relative rank of the graduate. The A-B-C – specifications has been abandoned in the ECTS User Guide as too large numbers of students were necessary to provide meaningful information. The Diploma Supplement has to be improved in this regard. Apart from this aspect, the panel considered the criterion to be fulfilled.

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. Sample of actual, filled in Diploma Supplement per programme

E Comment of the Higher Education Institution (14.02.2015)

The institution did not provide a statement, but submitted the following additional documents:

Sample of a Diploma Supplement for each programme

F Summary: Peer recommendations (24.02.2015)

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Chemical and Metallurgical (Lima)	With requirements	EUR-ACE With requirements	30.09.2021
Ba Plant Machinery Maintenance (Lima and Arequipa)	With requirements	EUR-ACE With requirements	30.09.2021
Ba Industrial Electrotechnics (Lima and Arequipa)	With requirements	EUR-ACE With requirements	30.09.2021
Ba Industrial Automation and Electronics (Lima)	With requirements	EUR-ACE With requirements	30.09.2021

Requirements

For all degree programmes

A 1. (ASIIN 7.2.) The Diploma Supplement must include the grade distribution (statistical data).

A 2. (ASIIN 2.3) The module descriptions must be made available also to external stakeholders.

Recommendations

For all degree programmes

E 1. (ASIIN 2.1, 2.4) It is recommended to base courses more on mathematical and scientific foundations and ensure that students understand boundary conditions and requirements in problem solving (e.g. control theory –

E 2. (ASIIN 2.1, 2.4) Analytical capabilities should be strengthened throughout the programme.

E 3. (ASIIN 3.1) It's recommended to re-consider the definition of "module" in alignment with the ECTS Users' Guide.

E 4. (ASIIN 3.2) It's recommended to monitor the workload of the students.

E 5. (ASIIN 3.3) It's recommended to include more English teaching elements into the curricula.

E 6. (ASIIN 5.1) it's recommended to further raise the number of Ma and PhD holders and facilitate current teaching staff obtaining a higher degree.

E 7. (ASIIN 5.2) It's recommended to facilitate and foster teaching staff mobility.

E 8. (ASIIN 5.3) It is strongly recommended to increase the number of agreements with international HEIs in order to allow more students to participate in exchanges.

E 9. (ASIIN 5.3) It's recommended to provide the students with more access to data-bases, journals and state-of the-art software.

E 10. (ASIIN 6) It should be ensured that students are systematically informed about the results of surveys in order to close feedback loops also in this regard.

G Comment of the Technical Committees

Technical Committee 01 – Mechanical and Process Engineering (05.03.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee 01 discussed the procedure and wondered if recommendation 1 should not be turned into a requirement. It was explained that the mathematical and scientific foundation was provided but it was not properly linked to practical engineering application. The Technical Committee suggested to add the indication to "applied engineering" in order to make the recommendation more comprehensible. The Technical Committee also wanted to know who carried out the actual teaching if recommendation 6 was calling for more staff members holding a Master's or a PhD degree. It was explained that it was common in other countries that staff members holding a Bachelor's degree lectured Bachelor students. The peers had noticed a significant upgrading of the overall qualification of staff members but still wanted to encourage the University to further upgrade its staff members; that it why this was only a recommendation. The Technical Committee could comprehend this reasoning but suggested underlining that the institution shall provide structural support for staff members to improve their academic qualification.

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

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee 01.

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

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Chemical and Metallurgical (Lima)	With requirements	EUR-ACE With requirements	30.09.2021
Ba Plant Machinery Maintenance (Lima and Arequipa)	With requirements	EUR-ACE With requirements	30.09.2021

Recommendations

E 1. (ASIIN 2.1, 2.6) It is recommended to base applied engineering courses more on mathematical and scientific foundations and ensure that students understand boundary conditions and requirements in problem solving (e.g. control theory) .

E 6. (ASIIN 5.1) It is recommended to further raise the number of Ma and PhD holders and facilitate current teaching staff obtaining a higher degree by structural support.

Technical Committee 02 – Electrical Engineering and Information Technology (10.03.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure. In order to better understand the peers' criticism concerning recommendation 1, it considers an editorial modification of the recommendation helpful. Along with that it deems the explanatory remarks in brackets to be dispensable. The Technical Committee also proposes a slight change in the wording of recommendation 6 so as to more clearly acknowledge the recruiting strategy the HEI has undertaken already following an identical recommendation in the previous accreditation.

Apart from that, the Technical Committee agrees fully to the assessment and conclusion of the peers.

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

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee 02.

The Technical Committee 02 – Electrical Engineering and Information Technology recommends the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Industrial Electrotechnics (Lima and Arequipa)	With requirements	EUR-ACE With requirements	30.09.2021

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Industrial Automation and Electronics (Lima)	With requirements	EUR-ACE With requirements	30.09.2021

Recommendations

E 1. (ASIIN 2.1, 2.6) It is recommended to use mathematical foundations more strongly in the technical parts of the curriculum and ensure that students understand boundary conditions and requirements in problem solving (e.g. control theory).

E 6. (ASIIN 5.1) It is recommended to continue raising the number of Ma and PhD holders and facilitate current teaching staff obtaining a higher degree.

Technical Committee 09 – Chemistry (09.03.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee indicates that it is not in a position to decide about the award of the EUR-ACE label and leaves the assessment thereof to the engineering Committees.

The Technical Committee 09 – Chemistry recommends the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Chemical and Metallurgical (Lima)	With requirements	EUR-ACE With requirements	30.09.2021

H Decision of the Accreditation Commission (27.03.2015)

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

The Commission discussed whether the recommendation to further improve the qualification of the staff members should not be turned into a requirement. The Commission learned that the overall qualifications of staff had been significantly improved since the first accreditation and therefore only a recommendation had been proposed. The Commission accepted this explanation and appreciated the proposed changes of this recommendation by TC 01 and TC 02.

The Commission concluded that the wording in recommendation 2 with regard to the mathematical and scientific foundations might be misunderstood and accepted the suggestion made by TC 02.

Regarding recommendation 4, the Commission understood that the structure of the programme was, in principal, acceptable even though according to European standards the terminology was uncommon. The Commission decided to delete recommendation 4 because the modules meet minimal standards and further explanations are provided in the accreditation report.

The Commission rephrased recommendation 5 and 6 to clarify the intended matter. All other requirements and recommendations were accepted as proposed by the peers.

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

The Accreditation Commission deemed that the intended learning outcomes of the degree programmes do comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committees 01 and 02.

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

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Chemical and Metallurgical (Lima)	With requirements	EUR-ACE With requirements	30.09.2021

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Plant Machinery Maintenance (Lima and Arequipa)	With requirements	EUR-ACE With requirements	30.09.2021
Ba Industrial Electrotechnics (Lima and Arequipa)	With requirements	EUR-ACE With requirements	30.09.2021
Ba Industrial Automation and Electronics (Lima)	With requirements	EUR-ACE With requirements	30.09.2021

Requirements

For all degree programmes

A 1. (ASIIN 7.2.) The Diploma Supplement must include the grade distribution (statistical data).

A 2. (ASIIN 2.3) The module descriptions must be made available also to external stakeholders.

Recommendations

For all degree programmes

E 1. (ASIIN 5.1) It is recommended to continue raising the number of Ma and PhD holders and facilitate current teaching staff obtaining a higher degree by structural support.

E 2. (ASIIN 2.1, 2.6) It is recommended to use mathematical foundations more strongly in the technical parts of the curriculum and to ensure that students understand boundary conditions and requirements in problem solving (e.g. control theory).

E 3. (ASIIN 2.1, 2.6) Analytical capabilities should be strengthened throughout the programme.

E 4. (ASIIN 3.2) It is recommended to monitor the workload of the students.

E 5. (ASIIN 3.3) It is recommended to include more English language in teaching.

E 6. (ASIIN 5.2) It is recommended to facilitate and foster teaching staff mobility.

E 7. (ASIIN 5.3) It is strongly recommended to increase the number of agreements with international HEIs in order to allow more students to participate in exchanges.

E 8. (ASIIN 5.3) It is recommended to provide the students with more access to databases, journals and state-of the-art software.

E 9. (ASIIN 6) It should be ensured that students are systematically informed about the results of surveys in order to close feedback loops also in this regard.

I Fulfilment of Requirements (08.04.2016)

Analysis of the peers and the Technical Committees (18.03.2016)

A 1. (ASIIN 7.2.) The Diploma Supplement must include the grade distribution (statistical data).

Peers	fulfilled Reason: The grade distribution has been added to the D.S.
TC 01	fulfilled Reason: The Technical Committee accepts the analysis of the peers and sees all requirements fulfilled.
TC 02	fulfilled Reason: The Technical Committee agrees with the analysis of the peers that the requirements are fulfilled.
TC 09	fulfilled Reason: The Technical Committee agrees with the analysis of the peers that the requirements are fulfilled.

A 2. (ASIIN 2.3) The module descriptions must be made available also to external stakeholders.

Peers	fulfilled Reason: All module descriptions are now available online.
TC 01	fulfilled Reason: The Technical Committee accepts the analysis of the peers and sees all requirements fulfilled.
TC 02	fulfilled Reason: The Technical Committee agrees with the analysis of the peers that the requirements are fulfilled.

TC 09	fulfilled Reason: The Technical Committee agrees with the analysis of the peers that the requirements are fulfilled.

Decision of the Accreditation Committee (08.04.2016)

The Accreditation Commission fully agreed with the findings of the panel and the Technical Committees.

The Commission decided to accredit the programmes as follows:

Degree Programme	**ASIIN seal**	**Subject-specific labels**	**Maximum duration of accreditation**
Ba Chemical and Metallurgical (Lima)	All requirements fulfilled	EUR-ACE	30.09.2021
Ba Plant Machinery Maintenance (Lima and Arequipa)	All requirements fulfilled	EUR-ACE	30.09.2021
Ba Industrial Electrotechnics (Lima and Arequipa)	All requirements fulfilled	EUR-ACE	30.09.2021
Ba Industrial Automation and Electronics (Lima)	All requirements fulfilled	EUR-ACE	30.09.2021