ASIIN Seal & EUR-ACE Label®

Accreditation Report

Bachelor's Degree Programme
Energy and Power Engineering

Provided by
Shanghai University of Electric Power

Version: 16 March 2021

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
能源与动力工程	Bachelor of Energy and Power Engineering	ASIIN, EUR-ACE® Label		01, 02
Date of the contract: 21 April 2020 **Submission of the final version of the self-assessment report:** 21 October 2020 **Date of the onsite visit:** 15-17 December 2020 **at:** online				
Peer panel: Prof. Dr. Günther Benstetter (Deggendorf Institute of Technology) Prof. Dr.-Ing. Hartmut Ulrich (University of Applied Sciences Ruhr West) Dr.-Ing. Martin Molzahn (retired; BASF AG) Yiran Tao (student, University of Shanghai for Science and Technology)				
Representative of the ASIIN headquarter: Verena Reiter				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: European Standards and Guidelines as of 10 May 2015				

[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

ASIIN General Criteria, as of 4 December 2014 Subject-Specific Criteria of Technical Committee 01 – [Mechanical Engineering/Process Engineering] as of 09.12.2011	

B Characteristics of the Degree Programme

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
能源与动力工程	Bachelor of Engineering Energy and Power Engineering	-	6	Full time	no	8 Semester	240 ECTS	1 September 1985 Every winter semester

For the Bachelor's degree programme Energy and Power Engineering, the institution has presented the following profile in the self-assessment report:

"The overall talent cultivation objective of Energy and Power Engineering major is cultivating high-level talents of 'engineering, innovation and internationalization', which is established based on Shanghai University of Electric Power's school-running policy of 'based on electric power, application and front line' and school-running philosophy of 'pragmatic and practical, sensible and far-reaching', in conjunction with the national energy strategy, the development needs of power industry, the needs of Shanghai's social and economic development, and the laws of higher education.

Relying on power industry, this major aims to train outstanding engineers with good social adaptability, international vision and engineering practice capabilities, and cultivate application-oriented technical talents with healthy personality, good physique, solid basic theories and professional knowledge, who have innovation awareness and team awareness, strong capabilities in engineering practice, independent working, learning, understanding and communication, as well as broad international vision. They are expected to engage in the design, manufacture, installation, operation and management related to power generation, thermal energy engineering, energy conservation, environmental protection, and new energy in the field of energy and power, and to meet the requirements of internationally recognized engineer qualifications and engineer vocational qualifications, thus laying a solid foundation for obtaining internationally recognized engineer qualifications."

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

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report (includes objectives-module matrices)
- Module handbook
- Audit discussions

Preliminary assessment and analysis of the peers:
For the degree programmes under review, the HEI presents an extensive description of learning outcomes in the Self-Assessment Report (SAR). This description is accompanied by learning module matrices for each programme, matching learning objectives, modules and the ASIIN Subject-Specific Criteria (SSC). No Diploma Supplement was yet provided.

Established in 1985, the study program has seen several changes and now provides a well-structured undergraduate program. Training students for future occupations in the power industry, by the time of graduation, they should be able to master the basics in the field of mathematics, physics, chemistry, and foreign languages. Their general knowledge should also provide them with social knowledge, knowledge of sports and military, and enable them to work in both national and international business contexts. Regarding their engineering knowledge, graduates should master the basic knowledge of computer sciences and information technology, mechanics, mechanical design, and electric engineering and automation. Furthermore, they should have basic engineering knowledge, in the field of engineering management, and knowledge of fluid mechanics. In terms of professional knowledge, being able to handle the structure, principle, function, and operation of equipment and systems in the power generation industry is at the core of the study program. Graduates should be able understand the frontier development and hot issues of the power generation industry as well as the key elements of safe energy production. The peers agree

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

that the described learning outcomes adequately correspond with the body of knowledge which is expected from a student in a Bachelor program in the field of Energy and Power Engineering.

The technological and practical competences, which the students should acquire during the program, are subdivided into three core areas. Regarding the students' operation ability, they should possess basic engineering operation skills and basic professional experimental skills in order to perform the primary usage of the main equipment and the systems of a power plant, which includes disassembling, assembling and repairing this equipment. Regarding their analytical abilities, graduates should be able to work with computer software and networks, to process and analyse experimental and practical data, to obtain and analyse various data in the production process of a power plant as well as be able to analyse and diagnose the operation effects of power plant equipment and systems. The peers believe that graduates understand contemporary social and technological hot issues from the perspective of power generation companies. When it comes to their design ability, the peers believe that graduates can conduct and design professional basic experiments as well as design, calculate, and analyse the main equipment and systems in the power generation industry. They agree that the target competences of the study programme align very well with the challenges which the graduates will face in their later professional life.

The study program not only fosters students' knowledge in energy and power engineering and trains the skills necessary for working this area. Teamwork and management ability, international ability, and vocational development ability are also important learning objectives of this program. The peers learn in the audit discussions that the university has several international cooperations and wants to further open itself towards worldwide research in the field of energy and power engineering.

From the documents provided and the audit discussions, the peers agree that the learning objectives fit the intended qualifications of the study program. In conclusion, they furthermore agree that all programmes adequately reflect the professional as well as academic requirements of the subject and comply with the expectations of the European Framework Level 6 (equivalent to Bachelor's degree programmes) as well as the respective Subject-Specific Criteria of the ASIIN Technical Committee 01 – Mechanical Engineering and Process Engineering. Thus, they also comply with the criteria for programmes of the European Network for Accreditation of Engineering Education and qualify for the award of the EUR-ACE® Label. The peers are certain that graduates with these skills are well prepared for a future employment in the energy and power engineering.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-assessment report
- University website
- Audit discussions

The peers agree that the name of the degree programme adequately reflects the aims, learning outcomes, and curriculum. The students as well as future employers know which qualifications they can expect from the program at the Shanghai University of Electric Power (SUEP).

Criterion 1.3 Curriculum

Evidence:

- Self Assessment Report (including objectives-module matrices)
- Curriculum
- Audit discussions

Preliminary assessment and analysis of the peers:
The panel reviewed the curriculum of the study program under consideration in order to identify whether the available modules can achieve the described learning objectives. This was done through the discussions, the matrices matching the general learning objectives and the module contents as well as the module descriptions. From the discussions with the stakeholders, the peers understand that the curriculum of the program is part of a constant review process in order to ensure that they meet the requirements of the industry and the government.

The entire curriculum system is divided into nine course modules, namely: national situation cognition/social cognition (humanities and society), vocational development ability, international exchange (language learning), science foundation, engineering foundation (which is subdivided into five different fields), professional foundation/engineering application, industry development, bachelor's thesis and practice.

The module “National situation cognition/social cognition” is supposed to enable students to establish correct social and historical views and life values in the People’s Republic of China, have good moral cognition and sound legal awareness, and recognize the importance of social environment in engineering practice. Furthermore, they should be successful in the field of humanities and artistic accomplishments, develop aesthetic taste, and improve their skills in writing and speaking. The module “Vocational development ability”

fosters students' physical and psychological qualities. They should have the ability to communicate and cooperate with others, understand industry development status and trends and national policies, have a good understanding of engineering ethics and vocational ethics, and have the initial awareness of innovation and entrepreneurship in order to lay a foundation for personal development after graduation. Foreign languages, communication and cross-cultural competences are trained in the module "International exchange". The module "Science foundations" is supposed to enable students to master the basic knowledge of mathematics, physics and other natural sciences, deepen their understanding of natural sciences, and improve their scientific accomplishments in solving practical problems in science and technology applications, thus laying a solid foundation for future professional learning. The core of the Bachelor's program Energy and Power Engineering is the module "Engineering foundation" which is subdivided into "Computer and Information", "Economic Management", "Electric and Automation", "Mechanics and Machinery", and "Fundamentals of Fluids and Heat". The sixth module of the curriculum, "Professional Foundation/Engineering Application" enables students to understand the basic knowledge (such as the structure and working principles of the main equipment and systems in the industry), and master basic professional experimental skills and operational skills. Furthermore, they should be able to apply theoretical knowledge to the actual production process of engineering, and to conduct preliminary engineering design and calculation analysis. This is supposed to lay a good foundation for the areas of installation, operation, commissioning, design improvement, development and research of power station equipment and systems. The module "Industry Development" trains students in order to understand the relevant core and cutting-edge professional knowledge and skills in industries and fields such as power plant energy and power, clean power generation technology, energy conservation and energy management, and lay a foundation for design, manufacture, installation, operation, management and scientific research in relevant industries of the future. The graduation project and graduation thesis constitute the eighth module of the curriculum. Students are expected to integrate knowledge, skills and abilities, propose solutions and solve practical problems, and complete graduation project tasks. Each student needs to independently complete the graduation project tasks and write the graduation thesis under the guidance of the graduation project tutor. All of the student's practical work (internship, in-class experiment, professional training) is summarized in the ninth module.

According to the credits and workload distribution of each module, national conditions cognition/social cognition, professional development ability and language courses have been established in semesters 1-4, including English, philosophy, sports, industry, military, etc., to familiarize students with English, humanities, law and career and improve their cross-

cultural communication skills, social awareness, professional awareness and humanities. As a result, students should have sufficient English skills and be able to conduct professional international exchanges. In addition to that, cross-cultural knowledge and the ability to work in and cooperation with foreign and multinational companies is encouraged according to the curriculum and the audit discussions. The peers welcome the aspirations of the university regarding international academic and industrial exchange. However, in the audit discussions, they have the impression that the students' oral communication skills in English are not sufficient for this endeavour. The students confirm that they would appreciate if they would get more opportunities to improve the English language in the spoken context. In order to reach the learning objective, students should practice their oral English skills just as much as their writing skills, and be encouraged to frequently express their opinion in presentations, discussions, and other interactive formats. In the course of this, students' internationality could also be improved by engaging them in discussions e.g. about past and current global developments.

From the 1st to 5th semester, basic science modules are offered, including mathematics, physics, chemistry and informatics. In the 1st-6th semester, basic engineering modules are important, including engineering knowledge and skills related to drawing, mechanics and machinery, electrical and control, heat and fluids, computer and information, thus laying the foundation for subsequent engineering applications and professional modules. The engineering application module is supposed to be taken in the semesters 5-7, involving energy and power engineering professional courses. This module is essential in the entire course system. The industry expansion module is arranged in the 6th-8th semester. This is an elective module that offers different courses for different program orientations, and this module deepens and expands the engineering application module. The different orientations, which students can choose from, are the following:

(1) Orientation of power plant thermal energy and power: The focus is on the advanced power generation technology, power plant operation and control technology, power plant monitoring and diagnosis technology. Graduates become proficient in the design, manufacture, installation, operation, management and scientific research in the field of power plant thermal energy and power engineering at the production frontline.

(2) Orientation of clean power generation technology: The focus is on the generation and treatment of pollutants, clean power generation technology and renewable energy. Students engage in the design, manufacture, installation, operation, management, teaching and scientific research related to environmental protection, clean production, and new energy power generation in energy and power industry and related fields.

(3) Orientation of energy conservation and energy management: The focus is on energy conservation technology and equipment, distributed energy systems, energy management and auditing.

The peers appreciate that students can choose an orientation according to their interest and their career plans. The curriculum offers both a solid foundation for a later career in the field of energy and power engineering as well as a large variety of topics for specialization. However, the peers emphasize the importance of a continuous revision of the curriculum in order to include the challenges and demands of the future. This is particularly the case in the field of clean power, renewable energies, and new energy systems. The peers believe that the students should not only be prepared for the job market at the time of their graduation but become leaders in the field of power plant engineering in the years to come.

Graduation internship and graduation project/graduation thesis scheduled for the two final semesters. In the eyes of the peers, the internship and the many practical experiences, which students have during the course of study, is one of the strong suits of this study program. This does not only apply to the graduation internship but to the several modules which include practical training (either in experiments, in the industry, or in simulations at the university).

The peers conclude that the curriculum allows the students to achieve the intended learning outcomes in order to obtain the degree. The overall objectives and intended learning outcomes for the degree programme are systematically substantiated and updated in the individual modules. It is clear which knowledge, skills, and competences students will acquire in each module. However, the peers highly recommend that all modules, which train students' English skills, undergo revision.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:
The peers understand from the documentation and the discussions, that the admission to Bachelor's degree programmes in China is centrally regulated and organized by the government. Graduates of secondary schools take the National Uniform Enrolment Examination (Gaokao). Based on the results, students may choose from subjects at universities distin-

guished in three categories (40 elite universities in the highest level, 100 key provincial universities at second level and the rest in the third category of general universities – with the Shanghai University of Electric Power as one of them). Students apply with their results to those universities open to them and the universities follow their own admission procedure. Those who meet the following conditions can apply for registration: (1) comply with the Constitution and laws of the People's Republic of China; (2) graduate from a senior secondary education school or have an equivalent education level; (3) physical condition meets relevant requirements. The university's admission adopts the principle of score priority, and there is no difference the candidates for different majors, that is, candidates are admitted according to the order of their choices from high scores to low scores and based on college entrance examination score. Universities are responsible for giving reasons to candidates who have been rejected. Since an admission reform in 2003, some universities, among them the Shanghai University of Electric Power, have also obtained the privilege to admit a certain percentage of students outside the Gaokao process, solely based on internal assessment and admission regulations. The number of students thus admitted shall not exceed 5% of the total admissions.

In conclusion, the peers agree that this process is nationally applied and transparent. Through this procedure, it is ensured that only highly qualified students are admitted to the program.

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

In their comments to the report, the programme coordinators state that China's power mix and characteristics will change dramatically due to the increasing proportion of renewable energy generation, such as wind and solar power. However, thermal power is still the main force in the whole industry. In order to be prepared for the upcoming challenges, the major of Energy and Power Engineering has strengthened the course of operation control and monitoring diagnosis in the direction of power plant thermal energy and power. Additionally, it has strengthened the course of energy management, energy conservation technology and other aspects in direction of energy conservation and energy management. The program coordinators explain that in order to better respond to the challenges and demands in the future the energy and power engineering major will update and optimize the specific teaching content in the teaching reform of each professional course.

Regarding the recommended revision of the modules training English skills, the program coordinators direct attention to the knowledge, skills and training opportunities of the students: In order to train their knowledge students chose elective courses with the help of which they "can understand several elements of communication, what is cross-cultural

communication, the role of culture in cross-cultural communication, and why we can understand dialogue but not understand its meaning; through learning and understanding language characteristics, understand the relationship between language and culture, master the indicative and extended meanings of vocabulary, analyze vocabulary with the same indicative meaning, different cultural values, and vacant vocabulary of cultural words; students understand different discourse patterns and reflected worldviews, and prevent crosstalk pragmatic failure in cultural communication and how to communicate appropriately; what is nonverbal communication, different expressions of nonverbal communication, and possible obstacles to nonverbal communication in cross-cultural communication; understand the different attitudes of different cultures to time and understand different How culture uses time, analyzes cross-cultural misunderstandings caused by differences in time concepts, understands the role of time concepts and behaviors in cross-cultural communication; the relationship between space language and culture, and the role of space language in cross-cultural communication, so that students can Maintain proper communication distance in cross-cultural activities; understand the basic concepts of strong and weak context culture, understand the communication style of people from different cultural backgrounds, understand the cultural factors of different communication styles, and understand the impact of communication styles in cross-cultural communication Obstacles, learn to use appropriate communication style; understand the connotation of values, understand Hofstede's cultural dimension and people's behavior characteristics."
In regard to their English skills, students "learn to analyze cultural differences in the cultural dimension; further understand the source of conflict, understand the relationship between errors, communication misunderstandings and conflicts, and The different understandings and attitudes of Eastern and Western cultures to conflicts, the different methods adopted during conflicts, the preliminary grasp of effective means and ways to resolve conflicts; the relevant theories of cross-cultural adaptation, the understanding of the symptoms, causes and coping methods of cultural shock; Several elements of cultural competence, and methods to cultivate cross-cultural communication awareness and ability."
Competence training teaches student to "master the skills to improve cross-cultural communication; take cross-cultural negotiation as an example to comprehensively test students' knowledge and ability in cross-cultural communication. Students are required to understand the role and influence of cultural differences in cross-cultural negotiations, understand the characteristics of Eastern and Western cultures in negotiations, understand the impact of different ways of thinking on negotiations, and learn how to negotiate with Americans and Japanese."

The program coordinators believe that by participating in elective courses such as “Cross-Cultural Communication” and “English-speaking Society and Culture”, students can understand the connotation of culture, the relationship between culture and communication, understand how culture affects people’s perception and behavior, and enhance cross-cultural awareness. Deepen students' cross-cultural understanding, understand the crux of cultural conflict, and learn how to effectively communicate and cooperate with people of different cultural backgrounds.

The peers consider the criterion to be fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report
- Curriculum
- Module handbooks
- Audit discussions

Preliminary assessment and analysis of the peers:

The study program under review is divided into modules which comprise a sum of teaching and learning. The panel found the structure of the modules in general to be adequate and manageable. All programmes also include a certain variety of elective courses among which the students can choose in order to develop in individual specializations.

After analysing the module descriptions and the study plan, the peers see that the individual courses correspond with the definition of “module” in the sense that each course is a sum of coherent learning and teaching units. Thus, the peers agree that the structure and modules of the programmes contribute to the achievement of the intended learning out-

comes, a successful study process and the job opportunities of the students after graduation. The students are also able to define an individual focus of study by choosing between the electives of the three orientations.

The curriculum is structured in a way to allow students to complete the degree without exceeding the regular course duration. Students and teachers confirm in the audit discussions that the majority of students is able to graduate within the intended study time. The teachers monitor the progress of their students and get into contact with them if they worry that they will not acquire enough credits.

Furthermore, the peers are convinced that working practice intervals and internships are well-integrated into the curriculum, and the higher education institution vouches for their quality in terms of relevance, content, and structure. Practical work is a very important part of this curriculum. This includes lab work, experiments, open design projects, and internships. Students receive internship guide books in order to know how to best integrate the internship into their curriculum and in order to be informed about the accompanying regulations and requirements. In the audit discussions, the peers learn that the university defines three types of internship: The first internship is more like a visit. The students will see everything and check models at the respective power plant. The second internship takes two weeks and is a production internship with an engineer on site. The third internship is the graduation internship. Students work with industrial type simulators at university because they cannot operate the equipment and machines at the real power plant. Simulation helps them with that. Additionally, the work in the industry and thereby can also find projects for the final thesis. The peers praise the multiple opportunities in the curriculum which allow students to apply their knowledge in practice.

In sum, the peers agree that the structure and modules of the programme contribute to the achievement of the intended learning outcomes, a successful study process and excellent job opportunities for the students after graduation.

Criterion 2.2 Workload and credits

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Course overview

Preliminary assessment and analysis of the peers:
The peers learn from the documentation that the completion of a 16-hour theoretical module course is equivalent to one Chinese credit, which is approximately equivalent to 1.5 ECTS credits (except for language teaching and general education courses). In the practice module, completing 20 hours of study is equivalent to one Chinese credit, which is approximately equivalent to two ECTS credits. Chinese credits only count contact time while ECTS credits count not only contact time but also self-study time. From the perspective of ECTS credits, a students' study workload is the sum of their contact time and self-study time. Generally speaking, the university follows the range of the ECTS user's guide and regards 30 study hours (including contact time and self-study time) as equivalent to one ECTS credit, although there are differences between the foregoing two self-study time credit systems. After converting Chinese credits into the ECTS credit system, the average credits for one academic year are 60 ECTS credits or 1800 study hours (workload).

After completing four years of study, students must obtain the Chinese credits equivalent to 240 ECTS credits, that is, an average of 30 ECTS credits per semester. The credit difference between different semesters should not exceed three ECTS credits. The workload of each semester is relatively balanced and should not cause structural pressure on the quality of student training and the teaching level of teachers. The course teacher analyses the test results, and the counsellor and the head teacher survey students' study time to obtain the actual study amount of students each semester and ensure that their actual study amount is consistent with the planned workload. Each student must complete approximately 900 study hours (workload) per semester. Thereby, 30 learning hours (workload) are equivalent to one ECTS credit.

The students confirm that the workload is adequate. This is also the impression of the peers when reviewing the documentation of the university. The workload is generally suitable; courses provide enough credits and contribute to the study process. Structure-related peaks in the workload are avoided. In addition, the study program can usually be finished within the intended time of four years with very few exceptions.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Report
- Module descriptions
- Exam regulations and teaching quality assurance process
- Audit discussion

Preliminary assessment and analysis of the peers:

From the presented material as well as the discussions on site, it becomes apparent to the peers that pedagogical skills are highly valued at the university and that new teachers receive training and guidance by senior lecturers. Evaluations of pedagogical skills and methods are frequently performed and workshops and trainings are offered to the teaching staff. The quality of teaching as assessed by the course evaluations is a precondition for internal promotion. However, the peers recommend that the teachers consider using a larger variety of teaching methods.

The basic natural science courses are mostly taught in large classes with about 100 students, while professional basic courses are taught in a smaller setting with 60 students. Some professional courses are taught with only 40 students. Since most course modules also contain experimental parts, those are taught in groups in the relevant laboratories. In order to train students to work at power plants, simulations are a frequently used methodology. In order to include students into current research, they can participate in teachers' research projects.

During the Covid-19 pandemic, the university was quickly able to switch to online learning. The municipal government helped all schools in Shanghai to accumulate the necessary resources for online education since the goal was to restore teaching as soon as possible. They were able to resume all lessons and classes after only two weeks (and therefore were only two weeks behind). For the experiments, they conducted a virtual simulation. Therefore, about 90% of experiments were done by simulation. The rest was moved to the summer holidays. As a result, 100% of the teaching results were achieved. The peers are very impressed by this quick adaption of the university to these difficult circumstances and congratulate them on this success. The peers see long-term positive effects on the teaching methodology as new methods and approaches had to be developed.

Online teaching is widely used. There are corresponding course pages on the university's website, introducing the syllabus of the course, recommended textbooks, learning resources, teacher resumes, etc. Students can find information related to the course online, and they can also ask the teacher questions on the online platform, WeChat, QQ, or via email.

In the discussions with the students and teachers, the peers learn that the education in the classrooms mostly follows are very traditional approach. They would appreciate if the teaching methods chosen would encourage the students to engage in discussions and learn to express their point of view. As a result, the peers recommend that teachers consider more interactive methods of teaching and make the students active participants in the learning process.

In summary, the auditors consider the applied teaching methods and the underlying didactic concept as sufficient and useful to support the students in achieving the intended learning outcomes. However, teacher should regularly consider more innovative teaching methods and integrate the students to a greater degree.

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:
The peers get a comprehensive impression of the offers related to support and assistance of the students. The students confirm that an open-door policy is practised and that the students can always approach all teaching and administrative staff. They have several contact persons and resources they can rely on.

According to the university, the Student Office is responsible for "guiding and supporting the ideological and political education and management of the entire school's students, including: formulating and improving various rules and regulations related to student work; comprehensively promoting quality education, improving the overall quality of students, maintaining normal teaching order, and creating good teaching atmosphere; responsible for daily affairs management such as undergraduate student status management, file management, and violation handling; instructing, coordinating and evaluating the student management work of each school; organizing and implementing awards, help, loans, part-time job, subsidies, reductions and other student support work; responsible for students' career development education and employment guidance process management services; responsible for student dormitory management and student publicity, education, counseling, etc.; organize and carry out student work-related education training and theoretical research."

Further support can be received through the student counsellor system. Each grade has two fulltime undergraduate counsellor which help in almost all areas of life (personal, academic, professional). In addition, the head teacher of each class is providing knowledge and assistance for the students. The head teacher helps the students in academic affairs all the way to graduation. Students' innovative and practical skills are supported by academic and corporate tutors who encourage students to pursue their interests and guide them through academic studies and their internships. Apart from the personal supervision and academic support, the university offers a broad variety of support measures, be it in the form of sports clubs, science clubs, or research teams.

In the opinion of the peers, there is an open and active student environment, especially since students are usually accommodated on the campus and have easy access to learning, research, and recreational facilities. In summary, the peers agree that the support and assistance measures contribute to the successful completion of the study program under review. They praise the various support measures that students receive during their four years in this study program.

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

Concerning a diversification of the teaching methods, the university has made an attempt in teaching innovation in some courses. They have outlined some examples. For example, they are developing what they call “flipped classroom” in teaching by making the students active participants in the teaching process: for example, the teacher will divide the students into groups and assign the tasks related to the course. The students can find the relevant information after class according to the teaching content. Groups will work together and each group will make a course report and discuss this in class. Another example would be teaching through self-learning operation and teachers' online guidance with the help of which students can finally carry out the simulation operation of thermal power plant units like playing a game. In order to achieve good operation score, students need to repeat the operation practice, which is supposed to enhance the students' autonomous learning ability. Although the university has some innovative attempts regarding teaching methods, they wish try more diverse teaching methods and promote them. They plan want to strive for more innovation, integrate the students, and really improve the students' interest in learning.

The peers consider the criterion to be fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Exam regulation and teaching quality assurance process
- Presentation given during audit
- Audit discussions

Preliminary assessment and analysis of the peers:
All course content within the reviewed study programmes is examined. At the beginning of the semester, the teachers inform the students about what to expect in regard to the examination and the components of the final grade. The examination type is defined in the module descriptions. In each course the final grade represents a mixture of students overall performance during the classes (attendance, homework, participation), the mid-term exams (if the subject is regarded as important) as well as the final exam at the end of the semester. If applicable, experiments and internship reports are also part of the final grade. The peers learn that the final grade is usually composed as follows: 70-80% final exam, 20-30% overall performance (homework, attendance, mid-term exam), 10% experiments and reports. The score record is divided into three forms: a hundred-point system, a five-level system, and a grade system. Course exams are generally scheduled to take place during the final exam week.

Examination types are selected based on their competence orientation and may include written exams, presentations, and project work. Written exams include open-book exams, closed-book exams, and other test paper forms. Non-written exams usually are an assessment of the completion of comprehensive assignments, designs, papers, etc. The assessment of a course is usually done by the teacher responsible for the class. Course design, independent experiment courses and graduation project (thesis) are generally assessed by a combination of teacher review and on-site defense.

If a student does not pass an exam, the student will have one more chance to repeat it at the beginning of the next semester. If they fail for the second time, teachers will calculate how many exams the student has not passed in total. If the student has reached a limit of points, which have not been achieved, the student cannot move on to the next year. The student needs to start the year all over again. If the student has not yet surpassed the limit of missed credits, extra study time needs to be invested in the area of the failed exam in the new semester in order to catch up.

The peers appreciate that the university invests a lot of effort in ensuring that the exams are fair and transparent. Extensive documentation is provided which confirms that a clear set of regulations makes sure that all students are treated equally and that the examination is object, valid, and reliable. The students and the teachers are perfectly well informed how the examination is conducted and what is expected of them.

Students' graduation project/thesis (including graduation internship and graduation defense) starts from the eleventh week of the second half of the seventh semester to the entire eighth semester. Graduation project scores are generally composed of three parts,

namely the tutor's evaluation score, the review teacher's evaluation score, and the graduation defense score. The school can clarify the proportion of the three parts' grades to the graduation project grades according to the characteristics of subjects, formulate corresponding implementation rules, submit them to the Academic Affairs Office for filing and review before implementing them. The peers believe it to be a good system that students can do their graduate design based on the work they did in a company or write their thesis with the help of the company. As an alternative, they can find a tutor on campus and join them in their research project out of which they can come up with a graduation thesis. The peers appreciate that the students are able to choose between writing their thesis either with the help of a company or on campus. In addition, the extensive practical component of the bachelor's project is a good opportunity for the students to actually apply the knowledge they have acquired over the years.

The peers learn that the students approve of the examination system and are generally content with the workload. In the opinion of the peers, the workload as well as the composition and distribution of the exams is appropriate. The students confirm that they are well informed about the examination schedule, the examination form and the rules for grading. The number and distribution of the exams ensure that both the exam load and preparation times are adequate. All exams are organised in a way which avoids delays to student progression caused by deadlines, exam correction times, or re-sits.

The peers consent that the programmes under review generally reflect the quality expected from university programmes on EQF Level 6. Consequently, the peers agree that the examination system in place adequately supports the students' learning progress.

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

The peers consider the criterion to be fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Report
- Staff handbook
- Audit discussions

Preliminary assessment and analysis of the peers:
The university provided a list of teaching staff within the program and their academic background as well as additional information on the teaching staff in the self-assessment report. The peers are convinced of the sufficient quantity as well as quality of the staff in order to convey the learning contents of the program under review. The university explains that it has a team of about 40 full-time faculty members, with academics of the Australian Academy of Technological Sciences and Engineering as the leaders. The peers confirm that the school has a sufficient amount of staff at the professorial level in order to guarantee a good academic education in this program. The team is composed of various talents such as New Century Excellent Talents in University, outstanding academic leaders in Shanghai, Shanghai "Oriental Scholars" distinguished professors, "Young Oriental Scholars" among others. The faculty is mainly composed of young and middle-aged backbone teachers, with excellent academic background and qualifications. As a result, the peers are convinced that the university continuously makes sure that they attract the best teachers for their school. The peers agree with 300 hours per year as the teaching workload of each professional employee in the school, in particular since the teachers confirm that they are content with this. Serving as a head teacher and providing scientific and innovative guidance for students of this major is an important reference for employee promotion, which is regarded as a good criterion by the peers.

Out of those teachers, five teaching teams have been formed: the boiler teaching team, the steam turbine teaching team, the unit teaching team, the thermal power plant teaching team, and the nuclear power teaching team. A professional course group has been established, and a course leader responsibility system under the leadership of the teaching team leader has been formed in order to coordinate the planning and construction of the course group. Furthermore, the teachers profess that they have enough time for research activities and that they are in close contact with the industry. Only about 10% of the teachers also engage in administrative tasks to a larger degree. The peers appreciate this since it ensures that the staff members are in close contact with industry demand and have sufficient time for teaching and research.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Audit discussions
- Teacher evaluation summary
- Exam regulations and teaching quality assurance process

Preliminary assessment and analysis of the peers:
The continuous development of the staff members in didactical as well as academic terms is of high priority at SUEP. The school offers various training opportunities which includes a one-month pre-job training for new teachers and a supervision by a senior teacher in the first year. Only then are teachers allowed to teach their courses independently. The peers regard this system to be quite helpful in assuring that the teaching staff builds up strong competencies in the pedagogical field. Furthermore, the university generously supports activities of the staff members, allowing for international mobility, participation in conference, publication of articles and language courses.

The university also cultivates double-professionally-titled teachers with international perspectives and has established a training mechanism for double-professionally-titled teachers. Double-professionally titled teachers have both an academic tile and professional experience in the industry. The university plans to send personnel under the age of 45 in this program to enterprises for an internship of one year. Only lecturers with at least one year of practical experience in corporate engineering can be awarded a senior title. Only those candidates with one year of academic research experience abroad will be awarded the title of a professor. The peers believe that these strict regulations ensure that the university has excellent teaching staff with several opportunities for personal, professional, and academic development.

Since every professional teacher has the opportunity to spend time abroad, the peers are convinced that the university actively pursues its plans to become more international. Every year, 3-5 teachers in the program will receive funding from the Shanghai Municipal Education Commission to receive one-year training and the opportunity for a stay at an international university. The university encourages teachers, especially young teachers, to receive training and to study abroad. For this endeavour, Shanghai University of Electric Power provides financial and personnel support.

In conclusion, the peers see that the university offers substantial support for professional development and relies on adequate measures in order to guarantee that its staff provides excellent teaching. In addition, the peers praise the university's continuous internationalization which is also reflected in the training of its teachers.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report
- Pictures of laboratories and equipment
- Information about laboratory center

- Audit discussions

Preliminary assessment and analysis of the peers:
The peers were able to gain a solid impression of the facilities and laboratories at the university with the help of extensive documents on the laboratories and the equipment. Due to the combined support from national as well as regional government, university officials confirm that they can dispose of an excellent funding for the future development. Over the last years, the university's funding has increased every year, which enables them to invest in course construction, laboratories, and student innovation projects. The impression of the solid funding is confirmed when the peers ask about how the university deals with the challenges of the Covid-19 pandemic. The peers were impressed how much support the university received from the government in order to switch to online education within a very short time. In addition to support from the government, the university benefits from several cooperations with the industry which also funds and supports their research projects. Furthermore, high-tech equipment and several models for simulations are also available to student research teams. In summary, the peers consider the available equipment very adequate for the performance of the programmes reviewed. Their opinion is shared by the students who are content with the resources which the university offers.

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

The peers consider the criterion to be fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module handbook

Preliminary assessment and analysis of the peers:
The peers review the module descriptions for the programmes and see that they provide adequate information about the respective content, learning outcomes, examinations, workload distribution, responsible teacher, requirements and grading. However, the peers suggest that the learning outcomes could be described in more detail for each module.

The students confirm during the discussions that information about the courses is always available online and that details concerning examinations and contents are provided at the beginning of each course by the teaching staff.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Samples of certificates

Preliminary assessment and analysis of the peers:
At graduation, each student is provided with a diploma. However, each student should also be presented with a Diploma Supplement, providing information about the programme, the curriculum, the individual grading, the average grading and the higher education system in China. The peers have so far not received a Diploma Supplement, which would be required for the fulfilment of this criterion.

Criterion 5.3 Relevant rules

Evidence:

- Exam regulations and teaching quality assurance
- Student handbook (in Chinese)

Preliminary assessment and analysis of the peers:
From the documents provided and the discussions during the audit, the peers learned that SUEP follows a policy of transparent, open rules and regulations. All required rules and regulations are made accessible to students at any time online; full syllabi of the course contents are also provided to the students at the beginning of each course. The discussion with the students confirms that they feel well informed about regulations and comfortable about the access to any information regarding their study program. Since the university strives for a further internationalization of its study programs, the peers emphasize that all the relevant documents and regulations also have to be available in English. Furthermore, it would be helpful to have a larger segment of the university's website in English.

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

Concerning the module handbook, the University informs that they have revised and improved the descriptions of the learning outcomes.

In addition, the university has provided a Diploma Supplement.

Regarding the problem of the English content on the website, it was not yet possible to provide a complete English website due to time reasons. However, the university already took a first step and added the English module descriptions to the existing college's website at https://energy.shiep.edu.cn/ASIIN/list.htm, and the relevant materials have been uploaded to the website. In a second step, it is planned to establish a complete English website for the study program in the middle of 2021.

The peers consider the criterion to be largely fulfilled.

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Assessment-Report
- Students' score lists/students' results
- Exam Regulations and Teaching Quality Assurance Process
- Admission results
- Teaching Quality Assessment Form of Course
- Teacher Evaluation Summary
- Student Forms for Evaluation
- Evaluations by MyCOS Company (external partner for evaluations)
- Graduate Quality Evaluation Report and Questionnaires
- Audit discussion and presentations

Preliminary assessment and analysis of the peers:

At SUEP, a thorough system of quality management has been introduced and is observed in order to ensure the ongoing process of development and programme improvement. All courses are reviewed based on this feedback mechanism and updated if input from the various participating stakeholders requires it. Feedback from industry partners as well as alumni is regularly requested. At the centre of the feedback system are the course evaluations that are done by the students for each course. SUEP names four core areas of evaluation: evaluation mechanism involving teachers and students, student evaluation, alumni evaluation, and employer evaluation.

Every semester, the university conducts initial, mid-term and final teaching inspections which mainly include: lesson plan, lesson notes, classroom teaching, student learning effects, examination papers, and bachelor thesis process inspections, etc., in order to find solutions in time to the problems that may arise in the management process. Additionally,

each semester, the teaching supervisor from the university's academic affairs office will walk into the classroom and listen to lectures. The teaching supervisor then makes suggestions to teachers on teaching methods and will evaluate the teachers' teaching performance from many angles. Furthermore, teachers in the course group will advise each other and make suggestions for further development. If a teacher is at the bottom 10% for two evaluations, he/she will not be promoted or receive an additional title. Teaching inspection also provides a direct basis for evaluation, appraise and promotion of teachers (for teacher promotion, see criterion 4.2). Students can additionally provide feedback by talking to the president of the school (twice a year). In each class, there is also an information collector (who is with the students for four years) and brings their concerns forward.

In order to improve teaching, a professional teaching management system has been established which involves a teaching steering committee in order to study and review major areas of teaching. In addition, a teaching supervision committee was established. In the course of these improvements in the quality management system, the operation methods of information collection, analysis, feedback and rectification have been improved. The types of feedback include supervisory evaluation, leadership evaluation, peer evaluation, student evaluation and student feedback.

The university makes sure that the feedback loop is working properly. The Academic Affairs Office conducts regular teaching evaluations of the basic performance of teachers through the Teaching Evaluation System. This system is connected to the student surveys which are collected and organized by the Examination Committee. This committee submits the results to the Dean of College who formulates improvements and measures which are then communicated to the related course teacher. The teachers then close the feedback loop by being connected to the Academic Affairs Office and by discussing the results with the students. This is confirmed to the peers by the students who report that they feel their feedback is appreciated and taken serious.

The goals of the university regarding quality management are to establish an information management platform and a long-term mechanism of positive interaction. In addition, meetings should be held during the annual school anniversary and industry experts and employers should participate in the course system.

The university also relies on external partners for evaluation. Every year, the external partners MyCOS and Xinjincheng Data Technology are entrusted to conduct surveys on the employment situation of graduates, the alumni evaluation, and the employer evaluation. The peers learn from the self-report and the audit discussions that the employment situation of graduates is excellent. The course program trains them for a very specific work environment and also takes the current demand of the industry into account. As a result, graduates

usually have not problem finding an adequate employment within a short time after graduating. The peers are convinced that the employment situation regarding this study program is excellent, not least since the program aligns with aligns with the national economic development and is always adjusted accordingly.

In regard to student mobility and the university's internationality, the peers are convinced that the study program clearly benefits from the several international cooperations which the university has. Those cooperations include higher education institutions in Australia, the United Kingdom, Germany, Russia, Vietnam, Brazil and Korea among others. For instance, SUEP is also a chairman university in the International University Association for Developing Electric Power Technologies. The peers are certain that these international cooperations provide a great opportunity for both researchers as well as for students. As a result, the peers are concerned to hear that only very few students (are allowed to) take the opportunity and spend a semester abroad. The peers learn that teachers' recommendations and good grades are essential prerequisites in order to be considered for a semester abroad. The students confirm that they know about the possibility of going abroad and they are informed well; however, this is not reflected in the number of students who actually seize this opportunity. Consequently, the peers suggest that the university increases their efforts regarding student mobility and internationalization. This would also enable the students to train their foreign language skills and their international competence in practice.

In sum, the peers gain the impression that the Quality Assurance system at SUEP and within the faculty is well balanced and involves all relevant stakeholders. The measures ensure that the quality of the study program sees continuous improvement and that the assessment by the students plays an important role in the university's quality management. In order to better understand how the different stages and participants in the quality management circle are connected, the peers would appreciate to be provided a coherent document on the whole quality management circle.

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

The university has provided extensive documentation on the full quality management cycle, outlining the university's two-level teaching process quality management system and several other methods, mechanism, and tools which are used for quality management purposes.

The peers believe the documentation of the quality management circle to be adequate. As a result, the criterion is 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. A coherent and comprehensive document of the whole quality management circle.

E Comment of the Higher Education Institution (09.02.2021)

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

- Diploma Supplement
- Module Handbook
- Documentation of the Quality Management Circle

F Summary: Peer recommendations (20.02.2021)

Taking into account the additional information and the comments given by the University, 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 Energy and Power Engineering	With requirements for one year	EUR-ACE®	30.09.2026

Requirements

A 1. (ASIIN 5.3) All relevant regulations should be available to all stakeholders in English.

Recommendations

E 1. (ASIIN 1.3) It is recommended that modules concerning English language skills should be revised in structure and content in order to better train the students' oral communication skills.

E 2. (ASIIN 2.3) It is recommended to use more interactive teaching methods.

E 3. (ASIIN 5.1.) It is recommended to describe the learning objectives in more detail in the module handbook.

E 4. (ASIIN 6) It is recommended to increase students' academic mobility.

G Comment of the Technical Committees

Technical Committee 01 – Mechanical Engineering/Process Engineering (03.03.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure, in particular the learning objectives in the module handbook, and follows the assessment of the peers without any changes.

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

The Technical Committee deems that the intended learning outcomes of the degree programme does comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Energy and Power Engineering	With requirements for one year	30.09.2026	EUR-ACE®	30.09.2026

Technical Committee 02 – Electrical Engineering/Information Technology (05.03.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure, in particular the learning objectives in the module handbook, and follows the assessment of the peers without any changes.

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

The Technical Committee deems that the intended learning outcomes of the degree programme does comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering

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

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation**
Ba Energy and Power Engineering	With requirements for one year	30.09.2026	EUR-ACE®	30.09.2026

H Decision of the Accreditation Commission (16.03.2021)

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

The accreditation fully agrees with the technical committees.

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

The Accreditation Commission deems that the intended learning outcomes of the degree programme does comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering /Technical Committees 01.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Energy and Power Engineering	With requirements for one year	30.09.2026	EUR-ACE®	30.09.2026

Requirements

A 1. (ASIIN 5.3) All relevant regulations should be available to all stakeholders in English.

Recommendations

E 1. (ASIIN 1.3) It is recommended that modules concerning English language skills should be revised in structure and content in order to better train the students' oral communication skills.

E 2. (ASIIN 2.3) It is recommended to use more interactive teaching methods.

E 3. (ASIIN 5.1.) It is recommended to describe the learning objectives in more detail in the module handbook.

E 4. (ASIIN 6) It is recommended to increase students' academic mobility.

Appendix: Programme Learning Outcomes and Curricula

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor programme Energy and Power Engineering.

KNOWLEDGE

General knowledge:

- Master the basic knowledge of mathematics, physics, chemistry, foreign languages, etc.;
- Possess humanistic and social knowledge and the cognition of international and national situation;
- Have knowledge of sports and military.

Engineering knowledge:

- Master the basic knowledge of computer and information;
- Master the basic knowledge of mechanics, drawing and mechanical design;
- Master the basic knowledge of electric and automation;
- Master the basic engineering knowledge of engineering management;
- Master the basic knowledge of fluids and heat.

Professional knowledge:

- Master the structure, principle, function and operation knowledge of equipment and systems in power generation industry;
- Master the knowledge of safe production in power generation industry;
- Understand the frontier development and hot issues of power generation industry.

TECHNOLOGY

Operation ability:

- Possess basic engineering operation skills and basic professional experimental skills;
- Be able to perform primary operation of the main equipment and systems of a power plant;
- Have the ability to disassemble, assemble, and repair the main auxiliary equipment of a power plant.

Analysis ability:

- Have the ability to cooperate with computer software and networks, and the ability to effectively obtain and use information;
- Have the basic ability to process and analyze experimental and practical data;
- Be able to effectively obtain and analyze various data in the production process of a power plant, and analyze and diagnose the operation effects of power plant equipment and systems;
- Have the ability to understand contemporary social and technological hot issues from the perspective of power generation companies.

Design ability:

- Possess the ability of professional basic experiment and professional experiment design and implementation;
- Preliminarily possess the ability to design, calculate and analyze the main equipment and systems in power generation industry.

ABILITY

Teamwork and management ability:

- Have healthy psychology and personal character;
- Have a good sense of law and social responsibility;
- Have good communication and coordination skills, and teamwork spirit.

International exchange ability

- Have sufficient English knowledge and the ability to apply foreign language skillfully; Be able to conduct professional international exchanges;

- Have sufficient cross-cultural knowledge and be able to work in and cooperate with foreign or multinational companies.

Vocational development ability:

- Have the ability in re-learning, continued education and scientific research;
- Have a full understanding of the vocational responsibilities and vocational ethics of power generation industry.

The following **curriculum** is presented:

Curriculum and Teaching Process for Energy and Power Engineering

Courses Module	Course Name	Opening Division	Credits	Total Hours of study	Classroom Teaching	Self-study time	Credits per semester							
	Course Name						One	II	III	IV	V	VI	VII	VIII
Ideological and political	Ideological and moral cultivation and legal basis	Horse yards	3	90	48	42	3							
	Outline of China's Modern History	Horse yards	3	90	48	42		3						
	Introduction to Mao Zedong Thought and Theory System of Socialism with Chinese Characteristics	Horse yards	5	150	80	70			5					
	Basic principles of Marxism	Horse yards	3	90	48	42				3				
	Situation and policy (1) (2) (3)	Horse yards	2	60	32	28		1		0.5		0.5		
Languages and Tools	College English A(1) (2) (3)	Foreign languages	12	360	192	168	4	4	4					
	College English B(1) (2) (3)	Foreign languages												
	College English C(1) (2) (3)	Foreign languages												
	B of Programming Basis	Computer	5	150	80	70	5							
Comprehensive Literacy	Sports (1) (2) (3) (4)	Sports	7	210	112	98	2	2	2	1				
	Enrolment education	Learning	0.5	15	15	0	0.5							
	Mental health of college students	Operations	1	30	16	14	1							
	Military doctrine and military training	Military	1.5	45	45	0		1.5						
Innovative Entrepreneurship and Employment Guidance	Innovative Entrepreneurship Foundation		2	60	32	28							2	
	Career Planning and Employment Guidance	Operations	1	30	16	14	1							
Energy and Power Characteristics	Energy China	Horse yards	1	30	16	14		1						
	Light of the Silk Road	Foreign languages												
	Introduction to Energy	Ener												

	and Power	gy												
Humanities and Social Sciences	Course Directory of General Elective Courses 2 credits required		2	60	32	28				1			1	
Art Aesthetic	Course Directory of General Elective Courses 2 credits required		2	60	32	28				1			1	
Natural Science	Course Directory of General Elective Courses 2 credits required		2	60	32	28			1	1				
English Extension	Course Directory of General Elective Courses 2 credits required		2	60	32	28				2				
Public basic courses	A of mechanical drawing	Energy	4	120	64	56	4							
	Advanced Mathematics A(1)(2)	Mathematics	15	450	176	274	8	7						
	College Physics B(1)(2)	Mathematics	8	240	96	144		4	4					
	Physical experiments (1)(2)	Mathematics	3	90	48	42		2	1					
	Engineering mechanics	Energy	3	90	48	42		3						
	B of linear algebra	Mathematics	2	60	32	28			2					
	Probability Theory	Mathematics	2	60	32	28			2					
Professional courses	Foundation for Mechanical Design	Energy	3	90	48	42			3					
	Electrical and electronic technology (1)	Telecommunications	3	90	48	42			3					
	Electrical and Electronic Technology (2)	Telecommunications	2	60	32	28				2				
	Calculation method	Mathematics	3	90	32	58				3				
	General chemical B	Ringing	3	90	32	58				3				
	Engineering Thermodynamics	Energy	6	180	64	116				6				
	Computer Network Technology Foundation	Computer	2	60	32	28					2			
	Engineering Combustion Science	Energy	4	120	32	88					4			

Courses Module	Course Name	Opening Division	Credits	Total Hours of study	Classroom Teaching	Self-study time	Credits per semester							
	Course Name						One	II	III	IV	V	VI	VII	VIII
Professional Core Courses (Required)24 credits	Principle of Steam Turbine	Energy	6	180	64	116					6			
	Fluid Dynamics and Pumps and Fans (1)(2)	Energy	9	270	96	174				6	3			
	A of heat transfer	Energy	6	180	64	116					6			
	Boiler Principle	Energy	6	180	64	116						6		
	Thermal Power Plant	Energy	6	180	48	132							6	
	Unit unit centralized operation	Energy	6	180	48	132							6	
Professional elective courses (Public restricted)3 credits	Automatic Control Principle	Automation	4	120	32	88					4			
	Professional English	Energy	2	60	16	44					2			
	Electrical component of power plant	Electrical	4	120	32	88					4			
Professional elective courses	Computer Decentralized Control System	Automation	4	120	32	88						20		
	Thermal Engineering Testing Technology	Energy	4	120	32	88								
	Energy and air pollution control technologies	Energy	2	60	16	44								
	Gas turbines and combined cycles	Energy	4	120	32	88								
	Digital Electro-hydraulic Control Technology and Application	Energy	2	60	16	44								
	Supercritical and ultra supercritical units	Energy	4	120	32	88								
	Principle of Power System Condition Monitoring and Diagnosis	Energy	4	120	32	88								
	Waste heat boiler	Energy	4	120	32	88								
	Renewable energy generation technologies	Energy	2	60	16	44								
	Clean coal technology	Energy	2	60	16	44								
	Air conditioning	Energy	4	120	32	88								
	Introduction to Distributed Energy Systems	Energy	4	120	32	88								
	Thermal network technology	Energy	2	60	16	44								
	Energy management and audit	Energy	4	120	32	88								
	Introduction to Energy Saving Technology	Energy	2	60	16	44								
	Refrigeration Principles and B of Equipment	Energy	4	120	32	88								
	Engineering Training	Training	2	60	40	20		2						

Professional Practice Courses	Basic Course Design for Mechanical Design	Energy	4	120	60	60			4					
	Professional Production Practice	Energy	2	60	40	20				2				
	Design of Steam Turbine Principle Course	Energy	4	120	60	60					4			
	Boiler Principle Course Design	Energy	4	120	60	60						4		
	Thermal Power Plant Course Design	Energy	4	120	60	60							4	
	Simulation Practice	Energy	4	120	60	60								4
	Graduation internship	Energy	8	240	120	120								8
	Graduation Design (thesis)	Energy	25	750	280	470							8	17