ASIIN Seal

Accreditation Report

Bachelor's degree programme
Computer Science and Technology

Offered by

Shenyang Institute of Engineering Information College (China)

Version: 12/12/2025

Status: *Final version*

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	**(Official) English translation of the name**
计算机科学与技术	Computer Science and Technology

Date of the contract: 09.10.2024 **Submission of the final version of the SAR:** 28.03.2025 **Date of the onsite visit:** 05.-06.06.2025 **at:** Shenyang Institute of Engineering Information College (Shenyang, China)	
Expert panel: Prof. Dr. Madhukar Chandra, Technical University of Chemnitz; Prof. Dr. Martin Welsch, formerly IBM Germany R&D; Associate Prof. Haizhou Du, Shanghai University of Electric Power; Junhao Shan, student at Zhejiang Shuren University	
Representative of the ASIIN headquarter: Julia Tohidi Sardasht	
Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria as of March 28, 2023 Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science as of March 29, 2018	

B Context of the Degree Programme

B-1 Numbers and facts

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[1]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Computer Science and Technology	Bachelor of Engineering	n/a	6	Full time	n/a	8 Semesters	240 ECTS/ 170 Chinese credits	Yearly intake in the fall semester; first time offered in September 2004

B-2 Characteristics and features

The study programme evaluated in this report is Computer Science and Technology, a Bachelor of Engineering at the Shenyang Institute of Engineering (SIE). The Shenyang Institute of Engineering was approved by the Ministry of Education of the People's Republic of China in 2003. It was established by the Liaoning Provincial People's Government and the State Power Investment Corporation and lies its focus on electrical engineering, power engineering, control engineering, computer technology, and materials and chemical engineering.

The Bachelor in Computer Science and Technology is one of six core majors at the School of Information and began enrolment in 2004. According to the university's self-assessment report (SAR), the study programme is "a pilot major for the reform of the undergraduate engineering talent training model in ordinary colleges and universities in Liaoning Province and a provincial first-class major".

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

C Assessment of the Expert Panel

This accreditation report is based on the preliminary evaluation report for the degree programme under review. As the evaluation report strictly adheres to the relevant general and subject-specific accreditation criteria, no changes have been made to the evaluative chapters. The expert panel has taken the statement and additionally submitted documents of Shenyang Institute of Engineering Information College into account in its concluding remarks and recommended resolution.

The following sections of the report are based on the audit discussions the expert panel had with relevant stakeholder groups: Representatives of the Rector's office, programme coordinators, representatives of the Quality Management Department and the International Office, teaching and lab staff, students, partners from industry and the private sector, and alumni.

The focus of this stage of the evaluation lies on an assessment of the study programme under review according to the criteria stipulated in the ASIIN General Criteria. These criteria are the objectives and learning outcomes, the name of the degree programme, the curriculum (structure and content), admission requirements, workload and credits, didactics and teaching methodology, examinations, resources, internal quality management, and transparency and documentation. The evaluation can result in an accreditation procedure.

In addition to the audit meetings, the expert panel relies on the documentation about the programme and the regulatory framework that the Shenyang Institute of Engineering Information College has provided before, during and after the audit.

C-1 Objectives and learning outcomes of the degree programme [ASIIN 1.1]

Description of the current status

The relevant chapter in the self-assessment report (SAR) and related appendices outline the objectives and learning outcomes of the degree programme. The SAR links to an English university website on which the objectives are presented. On that website, the main objective of the study programme is described as "[providing] services to the service information technology industry and the energy and power industry in Liaoning Province and the whole country." Furthermore, the website lists the following objectives that graduates are expected to achieve five years after graduation: "consciously practice the core socialist values […], adapt to the development of the computer and related fields […], have innovative

capabilities […], possess strong communication and expression skills […], have an international perspective […].” These are referred to by the university as the training objectives of the programme.

The talent training programme of the university (app. 02-01) outlines the objectives and learning outcomes in line with government policy. It includes training objectives such as the ability to solve “complex engineering problems” using “in-depth engineering principles and analysis,” including collaboration with “different stakeholder groups across engineering disciplines.”

Regarding subject specific objectives and learning outcomes, the Objective-Module Matrix (app. 06-04) lists the courses that correspond to the respective subject specific learning outcomes. The learning outcomes of the individual courses will be discussed in more detail in the curriculum section of this report. The SAR complements this matrix with an overview of the knowledge, skills, and literacy that the bachelor’s programme in Computer Science and Technology is intended to provide. First, students are supposed to gain “relevant knowledge in the energy and power industry, demonstrating its relevance to service sectors” and to “build a solid theoretical knowledge system for students, meeting the school’s requirements for students’ knowledge reserves and reflecting its commitment to cultivating well-rounded talent”. The SAR describes the knowledge acquisition as a “knowledge chain” in which foundational courses build a base for subsequent, more advanced courses. Second, the SAR stresses the combination of practical and theoretical skills in the courses. Third, the study programme complements the thematic (computer science) education with a “humanities and social sciences literacy” through courses such as *Ideological and Moral Cultivation*, *Legal Education*, and *Introduction to Engineering Ethics* which are supposed to “enhance students’ professional ethics and social responsibility”.

The SAR states that there is an evaluation process in place in order to review the programme every four years. App. 05-01 provides an overview of this evaluation process, listing the evaluation contents, methods, and cycle. The evaluation focuses on these five aspects: “1. Whether the training objective meets the needs of regional economic development; 2. Whether the training objective is in line with the school’s talent training orientation; 3. Whether the professional field of the training objective is clear; 4. Whether the training objective has clear professional characteristics; 5. Whether the training objective can reflect the professional characteristics.” The university conducts a graduate survey, an employer survey, and an industry and enterprise expert survey to assess these aspects.

The evaluation process is furthermore visualized in this flowchart (app. 05-01, section VI):

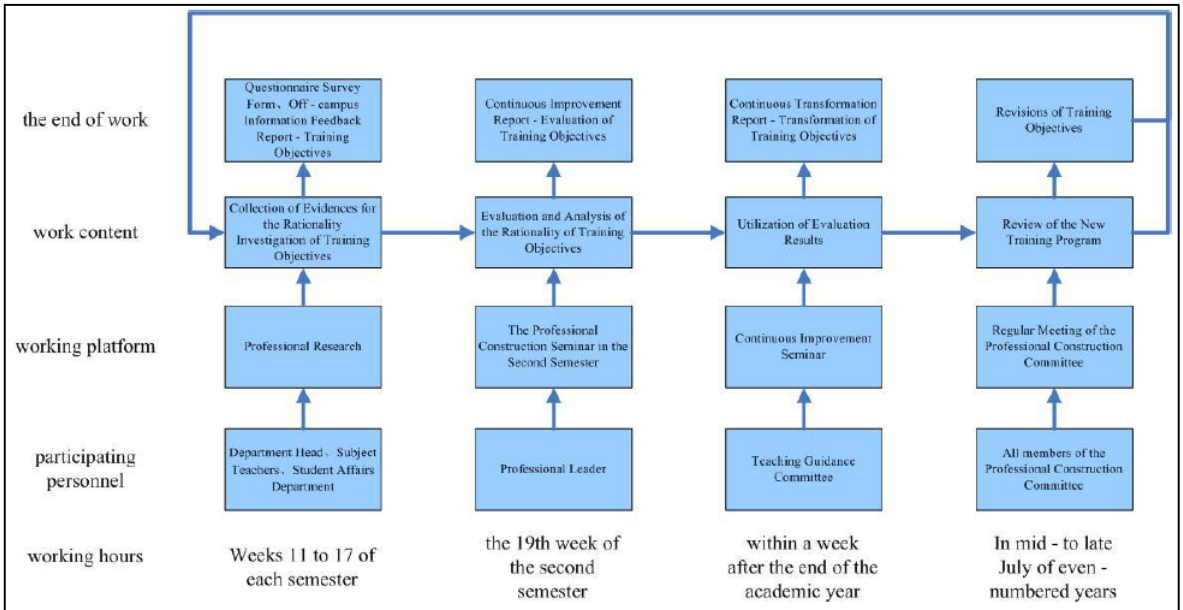

Figure 1 Flowchart of the Rationality Evaluation of Training Objectives

Analysis and assessment of the expert panel

The expert panel acknowledges that the Computer Science and Technology programme demonstrates a strong commitment to industry needs, as the programme's objectives reflect national and regional labour market needs – particularly in the energy and power sectors, which are strategic areas for the university as an application-oriented institution. Based on the on-site interviews with the relevant stakeholders, the expert panel furthermore recognizes the high employment rate of graduates and the university's overarching goal of internationalization through this evaluation and its emphasis on student-centred learning.

The expert panel notes that there is a formalized mechanism in place to review the programme objectives and learning outcomes that also incorporates industry feedback.

The on-site interviews confirmed the institutional claims, with students and teaching staff demonstrating awareness of the programme objectives learning outcomes and their implementation in teaching and assessment. Students and other interested parties can access the objectives and outcomes on the publicly accessible university website. Additionally, students can access those documents on the university online platform and through the university's WeChat-channels.

Based on the review of documents and audit discussions, the expert panel concludes that the programme objectives and learning outcomes are transparent to students and other interested parties and reviewed through a structured mechanism. While the strong alignment with (local) industry needs accounts for high employment rates, the programme

could be broadened to offer students more interdisciplinary learning experiences, complementing their training in computer science *and* technology and adhering closer to the subject specific criteria for computer science (see ASIIN-SSC 04, 2.1.5 Interdisciplinary Competencies).

Overall, however, the degree as a whole does meet the subject specific criteria of a bachelor's degree as the programme objectives cited above meet the following: "The Bachelor's programme conveys a broad spectrum of specialist knowledge and the fundamentals necessary for entry into professional practice. Graduates must be able to implement the scientific findings and problem-solving concepts in application areas. […] They work on the solution of complex problems and can further develop concepts, methods, procedures, techniques and tools of computer science […]" (ASIIN-SSC 04, 2.1 Requirements on Bachelor's Degree Programmes).

C-2 Name of the degree programme [ASIIN 1.2]

Description of the current status

The degree programme is called 计算机科学与技术 in Chinese and "Computer Science and Technology" in English. This double name, according to the university, reflects the theoretical backdrop of the discipline ("computer science") as well as the practical application ("technology") both regarding the intended outcomes and the teaching content. In the SAR, the university lists courses on data structures, operating systems, and computer composition principles as examples of theoretical teaching. Programming, software and hardware design, and system operations and maintenance are used as examples for practical teaching.

The name adheres to the naming conventions prescribed by the Ministry of Education of China. The designation is used consistently in the SAR, the programme handbook, and on the university's official website. As per national regulations, the programme name is aligned with a standardized list of degree titles, which ensures its recognition and acceptability across Chinese higher education institutions.

Analysis and assessment of the expert panel

The expert panel acknowledges that the programme title conforms with national standards and does not present any legal or formal inconsistencies. The naming follows the Ministry of Education's official taxonomy and is thus accepted within China's academic and professional systems. The English name used in all submitted documents is a literal translation of the Chinese programme name.

The expert panel summarises that the title of the degree programme does reflect the intended objectives and learning outcomes as well as the teaching and learning content. The designation (both in the original language and in English) is used consistently in all relevant documents such as internal university documents, public websites, and student records.

C-3 Curriculum [ASIIN 1.3]

Description of the current status

Content and structure

The Computer Science and Technology programme at Shenyang Institute of Engineering is a full-time bachelor's degree and structured over eight semesters. It awards 170 Chinese credits (equivalent to 240 ECTS). The curriculum is detailed in appendices 07-01 and 08-01, including hour allocations (class hours, lab/experiment hours, and self-study time), ECTS equivalents, and semester in which the course is taken.

The courses in the curriculum of the Computer Science and Technology programme are not grouped into modules. Rather, the teaching syllabus (app. 08-01), which is submitted as the module handbook, lists individual courses as modules.

The curriculum entails courses such as "Introduction to Computer Science" (first semester), "Advanced Mathematics (2)" and "Linear Algebra" (second semester), or "Data Structure" (third semester). The credits awarded for the courses differ, with most courses set between one to five Chinese credits each. The course list indicates a progression from foundational courses in the earlier semesters to advanced courses in later semesters. The courses listed in the teaching syllabus match the subject specific criteria for Informatics/Computer Science (ASIIN-SSC 04) and include, for example, courses that meet the formal and mathematical competencies ("Linear Algebra" and "Algorithm and Structural Desing Practice"), analytic and implementation competencies (C and C++ programming, "Software Project Development Practice"), technological competencies ("Linux Operating System", "Network Attack and Defense Technologies"), and methodological competencies ("Scientific and Technological Document Retrieval", "Practical Training of the Computer Technology"). Further correspondences are listed in app. 06-04.

The curriculum also contains non-thematic courses such as "ideological and moral cultivation and laws and regulations", college English, "liberal education" (amongst that sports, "Modern Chinese History", "Military Doctrine" or "Retrieval of Scientific and Technical Documents", to name some). The total credit count of those non-subject-related courses is not listed explicitly in the syllabus or course schedule.

Students have to do a mandatory graduation internship (worth three Chinese credits, equivalent to five ECTS) in their eighth semester alongside their thesis (worth 14 Chinese credits, equivalent to 18 ECTS). While the course schedule lists it as an internship, the teaching syllabus specifies that this is a practice course that also includes classes and self-study.

The university provides a course schedule (app. 07-01), which lists a total of 71 mandatory courses and 13 elective courses (in the fourth to seventh semester) of which a courseload worth six Chinese credits (equivalent to ten ECTS) can be chosen. For each course, the table states the in-class hours, the lab/experiment hours, the self-study hours, and the semester in which students have to take the course. The table is attached in the appendix of this report.

The courses are not grouped into modules but are tagged with a course category such as "liberal education", "engineering foundation", "engineering application" etc. Consequently, there are no learning outcomes defined for the modules or course categories as a whole but rather for each individual course.

Student mobility

The SAR understands 'student mobility' not in the sense of (international) exchange programmes to study part of the degree at another institution but rather as the possibility of changing majors within the home university. The SAR alludes to applicability of the course content in "different" and "related" majors, stressing that this can be practical for students when switching between majors. Regarding international mobility, the SAR points out that "[t]he school actively carries out international exchange and cooperation projects and provides students with opportunities to study abroad", but provides no evidence of that. The SAR only mentions a short-term study visit to Australia of a total of 14 days in the summer of 2024 (app. 09-02). It is not specified whether students receive credits for the participation in the study visit or whether this is an extracurricular activity.

Periodic review of the curriculum

In the SAR's section on the periodic curriculum review, the university describes the course evaluations through a teaching supervision team and (student) questionnaires. From the SAR alone, it is not clear whether a review of the curriculum with regard to the implementation of the programme objectives takes place, whether curricular changes are documented and whether the order of modules enables students to graduate within the standard period of study.

Analysis and assessment of the expert panel

Content and structure

The expert panel assesses the curriculum as well-conceived and functionally aligned with the programme's intended learning outcomes. The curriculum structure reflects a logical progression from foundational theoretical knowledge to applied and practical competencies, culminating in project-based and industry-focused learning experiences in the final year. The course sequence is indicated in the submitted appendices.

During the on-site visit, the expert panel could confirm with the students that the programme structure is clear to them. However, the expert panel also came to hear that students would like to have more opportunities for practical application and hands-on experiences in their studies and see more interdisciplinary elements in their programme. Regarding the practical laboratory work both in the context of both information technology and informatics, the expert panel highlights the necessity to connect theory and practice and recommends higher scrutiny in aligning the intended learning outcomes with the (practical) course content.

Moreover, the expert panel generally notes that the English proficiency level of both staff and students can be greatly improved. Taking into consideration the wish of the students, the expert panel therefore suggests that thematic courses such as the foundational computer science courses be taught in English so that student do not only have English language classes but also one or some of their thematic courses in English.

The expert panel positively highlights that industry and alumni feedback on new technologies and industry trends is taken into consideration when revising the curriculum content. The curriculum review is discussed below in more detail.

The expert panel furthermore recognizes the university's efforts to offer students practical work experience though internships. While students get to work on real projects during their internships, those internships are generally performed in industry training centres and not directly in the companies. The expert panel therefore calls for more direct involvement of the students in the industry day-to-day business. According to the industry representatives that the expert panel could talk to, the students of SIE are adequately qualified for their internships. The companies that the expert panel could talk to expressed their wish to extend the duration of the internships so that students could be longer involved in the projects they are working on.

Regarding the courses on socio-political and moral education, the expert panel acknowledges that those are part of national regulations and are therefore mandatory and award credits. However, as these courses take up a non-insignificant amount of the curriculum,

the expert panel suggests considering that those courses be retained as qualifying courses that are not examined to give students more room to focus on their thematic computer science courses.

Overall, the expert panel concludes that the curriculum reflects a strong commitment to industry relevance and student employability. Nevertheless, the expert panel suggests to further strengthen the academic rigour, interdisciplinary depth, and international orientation of the programme.

Student mobility

Besides the summer school in Australia mentioned above, there was no accessible data demonstrating structured student mobility, despite references to cooperation agreements with international institutions. In this regard, the panel also feels that the very premise of accelerating the mobility of students and teachers, at least in terms of proficiency in spoken English, is limited on both sides: among the lecturers and the students. Consequently, it sees significant scope for improvement in this area. This is supported by the wish of the students expressed in the on-site interviews to have exchange opportunities to Europe available to them. The students furthermore believe that a formal certification or accreditation of their study programme might make it easier for them to have their study progress recognized abroad. Moreover, financial support for English proficiency exams could encourage students to pursue studies abroad.

Periodic review of the curriculum

Through the interviews, the experts could find out that there is a standardized process for the review of the curriculum in place. Every two years, minor adjustments to the curriculum are made while every four years there are major adjustments. Moreover, there is a guiding committee on the provincial level that advises the dean and vice dean(s) as the ones responsible for the curriculum.

The expert panel furthermore positively notes that external feedback is taken into consideration when reviewing the curriculum. Industry experts and experts from other universities are invited to assess the curriculum. Based on this feedback, changes are made to the curriculum especially regarding new industry trends and technical developments. Examples stated in the on-site interviews were for example the intensification of training in programming languages and AI, or the inclusion of embedded systems developments in the curriculum.

While new technological development is integrated into the curriculum through industry feedback, the expert panel encourages the university to further formalize this process to

ensure a continuous update of the curriculum regarding future knowledge requirements and emerging fields.

C-4 Admission requirements [ASIIN 1.4]

Description of the current status

The SAR specifies the admission requirements as follows: “Candidates for the normal college entrance examination must take the National University Entrance Examination of the People’s Republic of China, or the unified college entrance examination held in relevant provinces and cities, and candidates must choose physics and chemistry when applying for this major” and provides the relevant scores in appendix 10-01:

Undergraduate Admissions in 2024(first and second batches)

Province	Major	Category	Required Score of the First Batch	Required Score of the Second Batch	Highest Score	Lowest Score
Liaoning	computer science and technology	science and engineering	-	-	548	537
Hebei	computer science and technology	science and engineering	448	448	576	573
Fujian	computer science and technology	science and engineering	449	449	578	573
Jiangxi	computer science and technology	science and engineering	448	448	543	543
Henan	computer science and technology	science and engineering	511	396	555	542
Guangxi	computer science and technology	science and engineering	371	371	523	509
Guizhou	computer science and technology	science and engineering	380	380	510	506
Yunnan	computer science and technology	science and engineering	505	420	535	518
Xizang	computer science and technology	science and engineering	305	265	304	294

Total Admissions: 30

Furthermore, admission is also based on “[weighing] the moral, intellectual, physical and aesthetic conditions of candidates” (app. 10-01) and online admission staff may check applicants’ ideological and moral assessment opinions and their medical history (app. 10-02).

The SAR refers to admissions statistics (app. 11-01) in which an admission rate of 100% in the last five years is mentioned.

Students who want to transfer to the Shenyang Institute of Engineering from another college or university must apply for transfer following the regulations stipulated in the “Notice of the Liaoning Provincial Department of Education on Further Improving the Work Related

to the Inter-Provincial Transfer of Students from Ordinary Colleges and Universities" (app. 12-02).

For international students, the SAR states that students might have to present IELTS or TOEFL language scores. However, in the mentioned appendix (app. 12-01), there is no indication of that. Furthermore, all classes are taught in Chinese (except the English foreign language classes). There is no mentioning on whether non-native Chinese speakers must provide any proof of their Chinese proficiency. Furthermore, there is no indication on what kind of (foreign) school leaving certificates are accepted for admission.

There is no indication of how either type of applicant can compensate for missing admission requirements nor whether regulations to ensure sufficient (subject-related) prior knowledge of the students are in place.

Analysis and assessment of the expert panel

The expert panel recognizes that the programme's admission system is compliant with national Chinese standards and provides a fair, transparent, and competitive process for student selection. The centralized Gaokao system ensures that students admitted to the programme possess a minimum academic level suitable for undergraduate studies. Due to the national and centralized admission procedure and since the government limits the number of students that can be admitted, the admission rate at SIE is stated as 100%. University-wide, SIE estimates a selective admission rate of around 15% which positions SIE nationally as a university with rather high performing students.

The expert panel furthermore recognizes that there is a credit recognition system in place for students that transfer in. Moreover, a committee can decide on the recognition of other experiences such as industry experience as credits.

However, there are no procedures in place for the recognition of prior learning (RPL), particularly from international institutions. According to ASIIN Criterion 1.4, "Rules for the recognition of qualifications achieved externally [...] are clearly defined. They facilitate the transition between higher education institutions and with non-university places of learning without jeopardising the achievement of learning outcomes at the desired level." While the experts acknowledge that national regulators set the admission criteria, the institution needs to develop and implement a recognition regime that adheres to the mentioned ASIIN standard to allow for more academic mobility and internationalization. This would also be logical and consequent regarding the internationalization objectives of the institution in general and the programme in particular.

Obviously, the national admission policy and regulations also hinders the university to introduce measures or preparatory mechanisms for students with potential deficits in prior knowledge. While the Gaokao system provides a robust filter, diversified pathways to higher education are becoming more common globally, and the institution may consider whether its current model sufficiently anticipates the future landscape.

C-5 Workload and credits [ASIIN 1.5]

Description of the current status

The Bachelor in Computer Science and Technology has a total of 170 Chinese credits (equivalent to 240 ECTS). The SAR states that students are required to graduate within four to six years. During the site visit, it was confirmed that for foundational courses, 16 class hours correspond to 1 Chinese credit. For more advanced courses, it is assumed that students will have to work also outside of class. Therefore, for these courses, 16 in-class hours and 14 self-study hours correspond to 1 Chinese credit. The SAR states that 1 Chinese credit is roughly equivalent to 1.4 ECTS (app. 13-01) which would correspond to a workload of 42 hours per Chinese credit. Furthermore, the teaching syllabus (app. 08-01) states the contact hours and hours of self-study for each class next to the corresponding credits.

While the SAR states that there is even distribution of workload over all semesters, there is no model study plan that shows that distribution. A rough distribution can be deducted from the course schedule (app. 07-01). There are between three and seven examination courses per semester.

Analysis and assessment of the expert panel

The expert panel acknowledges the university's efforts to align the programme with the ECTS system. The nominal workload of 240 ECTS credits for a four-year degree complies with ASIIN requirements. While the SAR lacks a general definition of contact and self-study hours per credit, course-specific workload data is provided in the syllabi.

The workload was generally perceived as manageable by both students and programme coordinators. It was noted that the earlier semesters are more intensive with basic and foundational courses, whereas later years are more flexible, focusing on internships, thesis preparation, and career orientation. This progression is consistent with the pedagogical intent to ease the burden in the senior years.

Although the SAR claims an even workload distribution, a structured model study plan is absent. However, the course schedule and examination data suggest a reasonable balance across semesters. In the view of the expert panel, the estimated workload is broadly

realistic and supports timely graduation. Nevertheless, the presentation of the workload model could be improved by including a standard semester plan to better visualize the credit distribution over time.

C-6 Didactics and teaching methodology [ASIIN 1.6]

Description of the current status

The SAR and teaching syllabus (app. 08-01) provide information on the different teaching and learning methods used in the study programme. Besides lectures and exercises, these include presentations, case studies, discussions, self-directed learning, group work, experiments, and study tours.

Regarding face-to-face teaching and self-study, the SAR states: “In order to ensure a reasonable balance between face-to-face teaching time and self-study time in the course setting, face-to-face teaching time is mainly used to systematically impart knowledge, demonstrate operation skills and answer questions. The self-study time is reserved for students to think deeply, expand their learning and practice operations, such as self-study of basic knowledge, learning cutting-edge technical materials, completing programming assignments, and carrying out project practice.”

Instructors use online learning platforms such as Chaoxing and Rain Classroom where they can upload course materials, teaching videos and practice questions. Students can use those platforms to submit homework, do online tests or participate in discussion forums.

Analysis and assessment of the expert panel

The expert panel commends the programme’s overall commitment to outcome-based learning and student-centred learning. The integration of multiple teaching formats – including presentations, case studies, and group projects, among others – supports the achievement of intended learning outcomes. The thesis structure and the emphasis on real-world application are in line with ASIIN standards. The teaching methods, together with their correspondence to the learning outcomes, are regularly evaluated. Moreover, the expert panel highlights positively that the teaching staff can take part in external didactic training and international conferences.

While the didactic methods also include hands-on tasks where students get to apply their theoretical knowledge, students expressed the wish to have more such opportunities which would train both their practical skills and their soft skills as they get to work in teams on applied projects. Moreover, students would also like to see more use of digital tools in

class. The experts note that AI tools are already used as enhancements to the existing learning methods.

From the on-site interview with the industry representatives, the expert panel can conclude that the students are well-trained and meet the industry demands but can improve in terms of their soft skills.

Lastly, the expert panel positively notes the university's commitment to process-oriented evaluation, meaning that the students' final grade is composed not only of the performance in the final exam but also includes participation in class, smaller assignments, and groups. The final exam usually accounts for 50% of final grade and the other, small assessments for the other 50%.

Final assessment of the experts after the statement of the Higher Education Institution regarding criterion 1:

The experts assess the criterion as partially fulfilled.

Learning outcomes and curriculum: The experts acknowledge that the university positions interdisciplinarity as a core pillar of its programmes and offers four specialized elective tracks within the Computer Science and Technology programme. Moreover, the university has demonstrated that it promotes cross-disciplinary competencies through cooperation and joint learning and teaching across departments. The experts acknowledge this but decide to maintain this recommendation to highlight the importance of a continuously updated inclusion of interdisciplinary aspects in the programme (see chapter E, E 1).

Programme name: As the university did not address this criterion in its statement, the experts confirm their previous evaluations and consider the sub-criterion to be fully fulfilled.

Curriculum: The experts acknowledge that SIE has established a Teaching Guidance Committee composed of industry experts, employer representatives, peer institutions, and graduate representatives which convenes annually with the teaching team to update the course curricula. The experts also note that major curriculum reviews take place every four years. However, as the course updates are an ongoing process due to rapidly evolving and ever-changing technology and developments in the field, the experts maintain their requirement to establish a mechanism that ensures such continuous updates (see chapter E, A 1).

Curriculum: Regarding the alignment of learning outcomes with course and project work, especially in applied and interdisciplinary contexts, the university states that assessments are based on real-world enterprise projects, and incorporate humanistic care, environmental protection, and resource optimization. The experts furthermore acknowledge that

abstract intended learning outcomes are broken down into observable competency indicators. However, the expert panel urges raising the challenge level in project and thesis work, so that the stated learning outcomes are adequately addressed. The expert panel therefore maintains this requirement and urges SIE to enforce the requirement in its fullest sense (see chapter E, A 2).

Curriculum: In response to the recommendation that the university consolidate its industry interface beyond the exiting training centres, SIE refers to its dual supervisor system where a campus faculty supervisor oversees the academic standards. However, no reference is made to practical training outside of the training centres. As these would allow students for more independent work experiences in real work environments, the expert panel maintains its recommendation (see chapter E, E 2).

Curriculum: Regarding the English language proficiency of students and teachers, SIE is developing English-taught core courses, has established a certification system for faculty teaching in English, and plans to deepen the cooperation with an Australian university to offer joint undergraduate programmes. Moreover, SIE has developed an online learning platform with English content. The experts welcome these planned measures but maintain their recommendation until implementation is fully realized (see chapter E, E 3).

Curriculum: Regarding the recommendation to not examine the non-subject related courses, SIE submitted the new 2025 curriculum for the programme. While some courses on political education, military training, and ethics are listed as non-examined courses, some remain listed as examined courses such as most of the Ideological and Political Education Courses. The experts therefore maintain their recommendation (see chapter E, E4).

Admissions: The expert panel acknowledges that the university has policies in place for intra-university major transfers, inter-institutional transfer within Chinese higher education, and for international enrolments. However, there is no policy in place for the recognition of qualifications achieved externally. The expert panel therefore maintains its requirement (see chapter E, A 3).

Workload: The experts acknowledge that in-class contact hours are limited to a maximum of 26 hours per week, and that the university provided a detailed outline of how the self-study hours are calculated. Moreover, the expert panel notes that a working group, composed of student representatives and academic administrators, has been established to regularly review the workload and ensure that it remains balanced across the semesters. The expert panel welcomes this initiative but maintains its requirement as no data or details on systematic workload assessments have been presented (see chapter E, A 4).

Didactics: The expert panel acknowledges that SIE has taken measures to enhance the quality of practice-based learning. SIE has co-established standardised training centres with industry partners where students can apply their theoretical knowledge in practical settings. Moreover, the practical curriculum has been restructured to include a three-tiered progression—basic operations, integrated training, and innovative application—in students' learning. The experts acknowledge this and therefore no longer consider a corresponding recommendation necessary.

C-7 Exams: System, concept and organisation [ASIIN 2]

Description of the current status

The SAR lists written or oral exams, quizzes, presentations, case studies, assignments, and group projects as forms of examination. Course schedule, teaching plans, and examination times are published on a university website at the beginning of every semester for students to consult. Furthermore, the examination methods and evaluation criteria for each course are published in the course syllabus (app. 08-01).

The graduation thesis serves as the programme's capstone project, designed to assess students' ability to independently complete a task relevant to their field of study. A supervising teacher is assigned to each student, and assessments are conducted via a combination of written submission and oral defence.

Regarding examination grading, the university states: "Theory courses (including professional elective courses) are scored on a 100-point scale. Physical education courses, intensive practice sessions and separate laboratory courses are assessed on a five-level scale, namely: excellent, good, moderate, pass and fail; General education electives are assessed on a two-tier scale, i.e., pass and fail." The final grade of a course is comprised of several examination elements such as homework, exams, presentations etc. Should a student have to take a make-up examination course because they failed a course or deferred the exam (upon approval of the university), the grade obtained in the make-up examination will be multiplied by 0.7 (app. 15-01).

Students must present their ID card and student ID card to be granted access to examination rooms.

Analysis and assessment of the expert panel

Regarding exams, the expert panel finds the academic level to be sufficient. Moreover, it is commendable that every semester, the course team convenes and checks whether the intended learning objectives are met with the examination methods. However, the on-site

interviews have shown that students get little feedback on their exams besides the grade. While the students stated that they can deduct a lot of information on their performance based on the grade, the university should consider optimizing the teacher feedback, providing the students with more details on their performance and on where they can improve.

The courses on moral and political education, as discussed above, make up a significant part of the curriculum. According to the submitted documents and the statements in the on-site interviews, these courses are also examined. The expert panel recommends that those courses get a qualifying character, meaning that students do not have to write exams in those courses but are rather graded on a pass/fail-basis.

The thesis serves as the final project of the Computer Science and Technology programme. The on-site interviews revealed that around two thirds of the students write their thesis related to their internship or on an industry project respectively. Staff of the company where students intern can be second supervisors of the thesis while the first supervisor is always a faculty member. The expert panel notes that the proportion of independent research in the theses assessed during the on-site visit is rather low and the theses rather focus on a study of a given software or programme. However, as the theses contain sections on a software use analysis, system design, and system implementation and testing, and the topics are connected to real-life problems, the expert panel ultimately assesses the level of the theses to be sufficient. The expert panel recognizes that there are relevant rules in place that regulate the organisation, administration and conduct of exams as well as grading and exam retakes. The students confirmed that those rules are known to them and communicated to them by the teachers.

Final assessment of the experts after the statement of the Higher Education Institution regarding criterion 2:

The experts assess the criterion as fulfilled.

The experts acknowledge that SIE has implemented a feedback mechanism for examinations. In this model, students receive various grades throughout a course, as there are several assessments that make up the final grade. However, there is no indication of whether qualitative feedback beyond the grade is provided. The experts therefore maintain their recommendation (see chapter E, E 5).

As stated above, regarding the recommendation to not examine the non-subject related courses, SIE submitted the new 2025 curriculum for the programme. While some courses on political education, military training, and ethics are listed as non-examined courses, some remain listed as examined courses such as most of the Ideological and Political Education Courses. The experts therefore maintain their recommendation (see chapter E, E 4).

C-8 Resources [ASIIN 3]

Description of the current status

Staff and staff development [ASIIN 3.1]

The university states in its SAR that there are 26 full-time teachers and 9 full-time laboratory teachers for the study programme in Computer Science and Technology, and that the student-teacher-ratio is about 15:1. All full-time lecturers have at least a master's degree in the field of computer science and technology; eight of the 26 lecturers have a doctoral degree. If needed, the university hires external lecturers.

According to the SAR, there are "academic lectures, symposiums, teaching and research activities, and [...] teaching competitions on campus to promote the exchange of teaching experience and innovation of teaching methods among teachers" as well as training programmes on the provincial and national level. New full-time lecturers furthermore undergo a one to two-year long training cycle (in its trial phase) during which at least one of their courses with its corresponding class materials will be assessed and they participate in teaching seminars and other trainings offered by the university (app. 17-02).

Student support and student services [ASIIN 3.2]

While it is not clear whether this is a compulsory part of the curriculum and who organizes it, the SAR states that the university "actively carries out employment guidance and helps students improve their employability and professional quality by holding employment lectures, career planning courses, resume production and interview skills training". Moreover, there is a "professional team of competition instructors to provide guidance on project selection, scheme design, technical implementation, and other aspects".

Funds and equipment [ASIIN 3.3]

The SAR states that for 2025, the main source of funding are fiscal grants (257.21 million yuan). The university is furthermore funded through the following: "Educational service revenue is expected to reach 140.09 million yuan, including tuition fees (114.59 million yuan), accommodation fees (10.02 million yuan), training income (11.03 million yuan), and other income (4.45 million yuan). Scientific research revenue is set at 70 million yuan […]. Additional income includes 29.86 million yuan from other sources and 10 million yuan in new debt income. Carry-over funds (i.e. budget) from 2024 amount to 136.33 million yuan (34.5 million yuan in fiscal special funds, 58.18 million yuan in institutional special funds, 41.74 million yuan in research special funds, and 1.91 million yuan in other special funds)."

The total revenue budget for 2025 amounts to 643.49 million yuan. Of that, 277.18 million yuan are personnel expenses, 248.89 million yuan are public utility expenses, 0.26 million yuan are used for debt repayment, and 117.16 million yuan are carry-over expenditures (i.e. spendings) from 2024.

The university further states in its SAR that the university facilities include a library with multiple reading and computer rooms, several teaching buildings, 28 laboratories, offices for staff, and conference rooms.

Analysis and assessment of the expert panel

Staff and staff development [ASIIN 3.1]

The expert panel commends the staff's commitment to the programme and their students. The expert panel finds that the teaching staff are academically qualified and sufficient in number to deliver the programme. From the on-site interviews with the teaching staff, the expert panel could find out that teacher teach around 4 hours (à 45 minutes) a week in the Computer Science programme but also teach in other majors and engage in other work.

While it is commendable that teachers are encouraged to engage with industry and other universities, only around one third of the teaching staff have a doctoral degree. Therefore, the expert panel suggests that the university should support PhD qualification efforts by other staff members to further increase the overall academic qualification level. In order to finalize the assessment of this criterion, the university is requested to provide complete, publication list of the academic staff.

Regarding the staff development, the on-site interview with the teachers has shown that each semester, the faculty members do a self-evaluation which will be posted on the (internal) university website, visible to all other faculty members and which is used for the performance review of the lecturers. To further improve the professional development of the staff, the expert panel recommends the introduction of an in-house continuing professional development programme for teaching staff as there have been no indications of such initiatives by the university besides programmes on the provincial and national level.

Student support and student services [ASIIN 3.2]

Regarding student support and services, the expert panel positively highlights the responsibility that the president of the university and dean of the programme assume. The panel observes that the student support system in the form of academic and career guidance is functioning in practice and generally meets student expectations. Students reported accessible and supportive services such as open office hours that the teachers hold, thesis support, and online communication channels.

Funds and equipment [ASIIN 3.3]

The expert panel confirms that the existing infrastructure and financial support are adequate to deliver the programme. Laboratories are well-equipped with modern tools, and students confirmed their usability. Laboratory and workshop infrastructure is found to be appropriate and generally aligned with programme needs. Moreover, the expert panel positively highlights the availability of "virtual" labs which are online programmes simulating the lab environment that students can use when the physical labs are not available.

Final assessment of the experts after the statement of the Higher Education Institution regarding criterion 3:

The experts assess the criterion as fulfilled.

The experts welcome the university's intent to increase the number of teachers holding a PhD and acknowledge the submitted publications list. The experts therefore no longer consider a corresponding recommendation necessary.

Moreover, the experts acknowledge the university's efforts to encourage staff to pursue doctoral studies and to sponsor domestic and international academic exchange programmes. The experts also welcome the teaching-focused workshops that are part of its continuous professional development programme. However, as didactical methods and computer science related technology undergo continuous development and change, a continuously updated professional development programme is necessary and therefore, the expert panel decides to maintain this recommendation (see chapter E, E 6).

As stated above, regarding the English language proficiency of students and teachers, SIE is developing English-taught core courses, has established a certification system for faculty teaching in English, and plans to deepen the cooperation with an Australian university to offer joint undergraduate programmes. Moreover, SIE has developed an online learning platform with English content. The experts welcome these planned measures but maintain their recommendation until implementation is fully realized (see chapter E, E 3).

C-9 Quality management: Quality assurance and development [ASIIN 5]

Description of the current status

The university provides information on its quality management in the SAR and the submitted documents. The SAR states that an "evaluation mechanism for program objectives,

curriculum design, course objectives, and graduation requirements was established, with ongoing tracking and assessment".

First, regarding the evaluation of the programme objectives, the SAR references the evaluation process conducted by the Academic Programme Construction Committee (without specifying how often or when this takes place). In this evaluation process, students, lecturers, supervisors and graduates are surveyed. Furthermore, the task group tracks the employment rate, salary, and job positions of graduates five years after graduation. The findings of those surveys result in an evaluation report that turns into suggestions for the revisions of the training objectives:

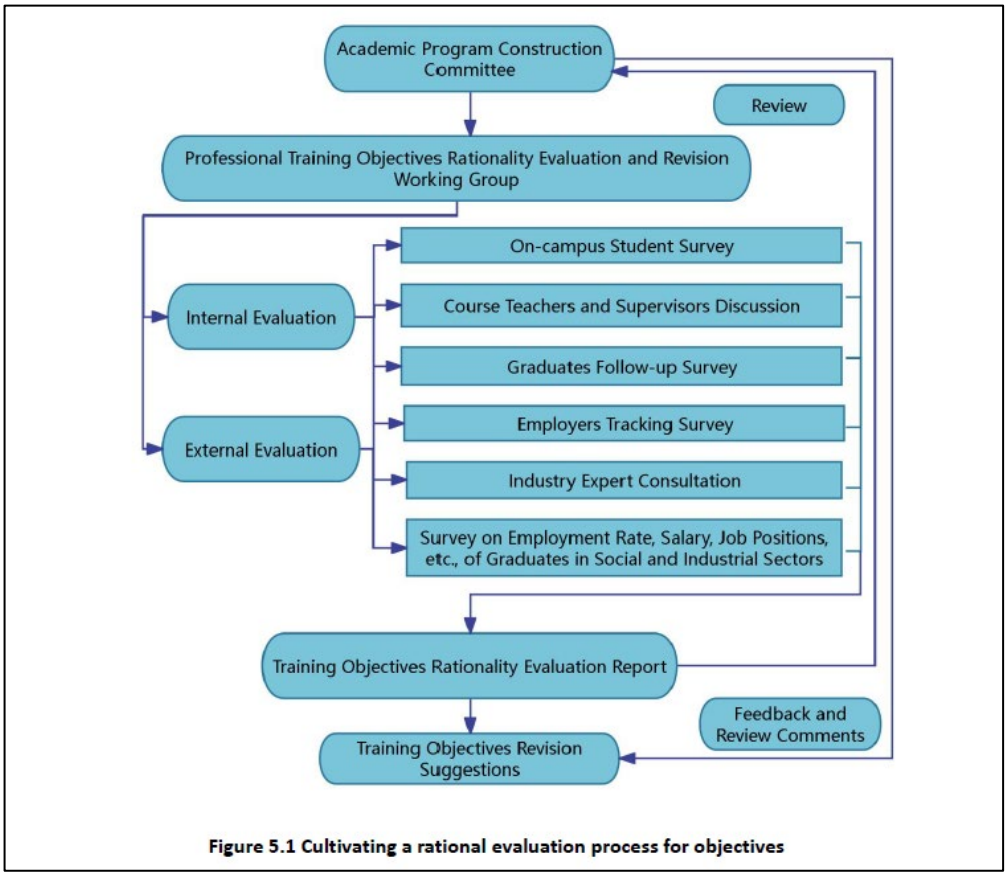

Figure 5.1 Cultivating a rational evaluation process for objectives

Secondly, the curriculum and teaching syllabus are evaluated by members of the Program Development Committee, faculty representatives, and industry experts.

Thirdly, the evaluation of the course objectives is directed by the course coordinator, "with course instructors and students participating as evaluators. The evaluation results are reviewed by both the course coordinator and the Teaching Guidance Committee."

Fourthly, the university evaluates the achievement of graduation requirements every other year.

Analysis and Assessment

The expert panel recognises that the university has established foundational structures for internal quality assurance, including survey instruments, programme-level coordination, and an overarching QA framework. These instruments provide a basis for ongoing improvement of the study programme.

During the on-site visit and the interviews with the programme coordinators, teachers, and students, the expert panel could confirm that there are feedback mechanisms in place. Students confirmed that they can give anonymous feedback and do believe that their feedback leads to change. The expert panel acknowledges that students can give feedback in several ways, such as through the teacher evaluations, the student-teacher symposiums in which students can address any issues directly with the teacher, and through a "mailbox". However, the expert panel recommends introducing formalized instruments to inform students of evaluation results and resulting changes to make those feedback loops transparent.

The programme coordinators further expanded on the different instances by which the teachers are assessed: by students, a peer-to-peer evaluation between the teachers, by the dean, and by external experts (industry experts and teachers from other higher education institutions).

The expert panel commends this multi-levelled approach to quality assurance.

Final assessment of the experts after the statement of the Higher Education Institution regarding criterion 5:

The experts assess the criterion as partially fulfilled.

The expert panel acknowledges the communication channel through the Student Congress for informing students of the results of programme and course evaluations. However, the experts recommend further formalizing this feedback loop and consolidating it in the feedback loop as an additional and explicit step (see chapter E, A 5).

Moreover, the expert panel acknowledges SIE's efforts to strengthen its QA framework. Especially with regard to the aforementioned point, the experts maintain their recommendation to fully formalize the QA procedures and make all steps transparent to all stakeholders (see chapter E, E 7).

C-10 Transparency and documentation [ASIIN 4]

Description of the current status

Module descriptions [ASIIN 4.1]

The SAR references the teaching syllabus (app. 08-01) as the module handbook with descriptions of the courses. Moreover, it links to a website that is supposed to "help students, parents, and teachers understand the relationship between courses and competencies, as well as details such as course credits, class hours, assessment methods, and evaluation criteria."

Diploma and Diploma Supplement [ASIIN 4.2]

The SAR and submitted documents state the protocol of how the diploma and diploma supplement are issued. The Chinese diploma is accompanied by a diploma supplement in English. The diploma supplement (app. 19-03) lists, among others, the programme learning outcomes, information on the grading system, and information on the Chinese higher education system.

Relevant rules [ASIIN 4.3]

The university attached relevant rules regarding professional training objectives, study plans, exam organization, make-up exams, and related materials in appendix 15-01. Throughout the submitted documents, the university refers to Party policy and regulations by the Ministry of Education of the People's Republic of China.

Analysis and assessment of the expert panel

Module descriptions [ASIIN 4.1]

The expert panel find the information provided in the teaching syllabus to be sufficient. The experts furthermore acknowledge that the module descriptions are accessible to students and other interested third parties through the academic affairs website. Moreover, the on-site interviews have shown that teachers also explain the learning outcomes, examination methods and didactical methods at the beginning of a course to their students.

Diploma and Diploma Supplement [ASIIN 4.2]

During the on-site visit, the experts could verify that a diploma and diploma supplement are issued and include all relevant information.

Relevant rules [ASIIN 4.3]

Lastly, the experts could confirm in the on-site interview with the students, that the students are sufficiently informed of all relevant rules. Channels of communication are the student handbook, digitals platforms (the academic affairs website), and a direct

communication by the programme coordinators in the case of changes to the rules. Moreover, as stated above, teachers inform their students of the relevant rules at the beginning of a course.

Final assessment of the experts after the statement of the Higher Education Institution regarding criterion 4:

As the university did not address this criterion in its statement, the experts confirm their previous evaluations and consider the criterion and its sub-criteria to be fully 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:

A 1. (ASIIN 1.5) Graphic timetable showing the logical sequence of courses and credits per semester (8-semester timetable).

A 2. (ASIIN 3.1) Publication list of the academic staff

E Statement of the Higher Education Institution (25.07.2025)

The institution provided a detailed statement as well as the following additional documents:

- [Appendix 1] Regulations on the Management of Undergraduate Programme Development, Shenyang Institute of Engineering
- [Appendix 2] Procedures for Evaluating the Relevance of Programme Objectives, Shenyang Institute of Engineering
- [Appendix 3] Procedures for Evaluating the Quality of the Undergraduate Curriculum Structure, Shenyang Institute of Engineering
- [Appendix 4] Implementation Guidelines for the Graduate Outcomes Survey on Educational Quality, Shenyang Institute of Engineering
- [Appendix 5] Syllabi for "Database Principles and Applications" and "Energy and Electric Power Application System Development Practice"
- [Appendix 6] Shenyang Institute of Engineering Undergraduate Student Credit and Grade Recognition Measures (SIE Academic Regulation [2023] No. 32)
- [Appendix 7] Shenyang Institute of Engineering International Student Qualification Review Standards
- [Appendix 8] Undergraduate Curriculum Framework for Computer Science and Technology, Class of 2025
- [Appendix 9] Semester-by-Semester Course Plan for the 2025 Cohort
- [Appendix 10] Resolution on the Work Report of Shenyang Institute of Engineering 2024 Student Congress
- [Appendix 11] Proposal Work Report of Shenyang Institute of Engineering 2024 Student Congress
- [Appendix 12] University-Enterprise Agreement
- [Appendix 13] Implementation Opinions on Enhancing University English Teaching Quality and Improving the Passing Rate of College English Test Band 4 (CET-4) [SIE [2019] No. 62]

- [Appendix 14] Provisional Regulations for the Shenyang Institute of Engineering's High-end Talent Introduction and Cultivation Program [SIE [2022] No. 88]
- [Appendix 15] Implementing Measures for the Shenyang Institute of Engineering Faculty Overseas Training Program [SIE [2023] No. 75]
- [Appendix 16] Evaluation Procedures for Assessing the Attainment of Undergraduate Programme Objectives, Shenyang Institute of Engineering
- [Appendix 17] Evaluation Procedures for Assessing the Attainment of Graduate Attributes, Shenyang Institute of Engineering
- [Appendix 18] Evaluation Procedures for Assessing the Attainment of Course Learning Outcomes, Shenyang Institute of Engineering
- Publication List of the School of Computer Science in the Past Five Years

The following quotes the comment of the institution (minor adjustments in formatting):

R1. (ASIIN 1.1, 1.3); Expert Feedback: It is strongly recommended that the university establishes a mechanism that reliably ensures the continuous updating of foundational courses to meet future knowledge requirements and developments in emerging fields.

School's Response: 1. The program has established a Teaching Guidance Committee composed of industry experts, employer representatives, peer institutions, and graduate representatives. At the end of each academic year, based on comprehensive analysis of teaching feedback (including student evaluations and faculty teaching reflections), industry development reports, and employer requirements, the teaching team convenes with the committee to update compulsory courses and electives. As specified in [Appendix 1], minor adjustments are made to core compulsory courses biennially, while a comprehensive revision of the talent cultivation plan - including objectives and curriculum framework - is conducted every four years. See [Appendix 2] and [Appendix 3] for details.

2. The program consistently conducts graduate career tracking surveys to collect longitudinal data, which serves as crucial evidence for updating both educational objectives and curriculum. The feedback analysis informs annual course adjustments to ensure alignment with emerging field requirements, as detailed in [Appendix 4].

Supporting Materials for R1: app. 1, 2, 3, and 4

R 2. (ASIIN 1.3); Expert Feedback: It is strongly recommended to align the coursework and project work with the intended learning outcomes of the respective module, particularly in applied and interdisciplinary contexts.

School's Response: Design Orientation**:** Course assignments and project practices are closely aligned with intended learning outcomes, particularly in applied and interdisciplinary teaching. Assessments are based on real-world enterprise projects, incorporating humanistic care, environmental protection, and resource optimization. The focus is on cultivating the ability to solve complex engineering problems, aligning with non-technical indicators in graduation requirements, as well as green and low-carbon principles and ideological-political education elements.

Outcome Deconstruction*:* Abstract intended learning outcomes are broken down into observable competency indicators, providing a basis for assignment and project design. During grading, each scoring component is explicitly linked to specific outcomes.

Applied Teaching Implementation*:* Using "real-world problems" as the core, the program leverages corporate platforms, industry-academia practice bases, competitions, and other resources. Through enterprise project components, students systematically develop professional competencies in interdisciplinary contexts while meeting practical industry requirements, thereby enhancing comprehensive literacy.

Evaluation and Evidence*:* A robust evaluation mechanism has been established. [Appendix 5] includes syllabi for one theoretical course and one practical course. In accordance with course objectives, both adopt interdisciplinary project-based learning, enabling students to acquire knowledge while solving real-world problems.

The course assessment methodology rationale is provided in [Appendix 06-1], and the learning outcome achievement analysis report is detailed in [Appendix 06-3] (accessible at: https://xxxy.sie.edu.cn/ASIIN_Filelist.jsp?urltype=tree.TreeTempUrl&wbtreeid=2538).
These ensure consistency between design implementation and course requirements, safeguarding teaching quality.

Supporting Materials for R2: app. 5

R3. (ASIIN 1.4); Expert Feedback: It is strongly recommended that the university establishes and implements rules for the recognition of qualifications achieved externally to facilitate the transition between higher education institutions and with non-university places of learning.

School's Response: Student Mobility primarily encompasses the following three categories:

1. Intra-university Major Transfers**:** The university has established clear policies for major transfers, specifying eligibility criteria and assessment procedures for students participating in transfer selection. For details, refer to the self-evaluation report. Credit and grade recognition rules are provided in [Appendix 6].

2. Inter-institutional Mobility within Chinese Higher Education**:** Policies governing student transfers between domestic higher education institutions are detailed on the Ministry of Education website: http://www.moe.gov.cn/jyb_xxgk/xxgk/zhengce/guizhang/202112/t20211206_585064.html

3. International Student Mobility**:** Since September 2017, our university has enrolled international students in programs such as Computer Science and Technology. Admission standards are available at: https://study.sie.edu.cn/Study_at_SIE/Admission.htm.See [Appendix 7] for supporting documents.

Supporting Materials for R3: app. 6 and 7

R4. (ASIIN 1.5); Expert Feedback: It is strongly recommended to establish and implement a mechanism to monitor student workload on a regular basis in order to identify and rectify discrepancies between credit point allocation and workload estimation, if necessary.

School's Response: In line with the revised 2025 programme framework, the total number of in-class credits has been reduced ***from 170 to 160*** (see [Appendix 8] 2025 Programme Framework). To ensure a balanced academic workload, the number of in-class contact hours is limited to ***no more than 26 per week*** per semester (see [Appendix 9] Semester-Based Curriculum Plan). Here's how we structure self-directed learning hours:

Political education courses: These courses include a relatively small proportion of self-directed learning (approximately 0.5 times the in-class hours), which mainly supports extended reading and reflection.

Mathematics, natural sciences, and language courses: These subjects involve a moderate amount of self-study (roughly equal to in-class hours). Students are expected to engage in error correction, derivation of formulas and theorems (for math/science), and repetitive, consistent input and output activities (for language), such as vocabulary acquisition, reading authentic texts, writing practice, and oral training.

Physical education and general electives focused on well-being: These courses typically do not include assigned self-directed learning hours, as they rely on regular physical activity and independent engagement.

Theory-intensive courses (e.g. Computer Architecture, Fundamentals of Algorithms)

These courses include a slightly higher proportion of self-learning (around 1.5 times of the contact hours), emphasizing problem-solving practice, concept reinforcement, and literature review to support deeper theoretical understanding.

Practice-oriented courses (including major electives and interdisciplinary modules):

These emphasize applied learning, project development, and knowledge integration, with self-study hours set at roughly twice the in-class hours.

Block-based intensive practical modules: For courses delivered in concentrated formats (e.g. during project weeks), students typically engage in hands-on tasks such as coding, debugging, and case replication. Given the already high weekly workload (approximately 30 hours), self-directed learning is set at about 1.5 times of the contact hours, ensuring alignment with the "learning by doing" approach.

2. A dedicated working group composed of student representatives and academic administrators has been established to regularly review workload data and ensure that the learning load remains balanced and manageable across the semesters.

Supporting Materials for R4: app. 8 and 9

R5. (ASIIN 5): Expert Feedback: It is strongly recommended that the university informs students of results and resulting changes of programme and course evaluations.

School's Response: Under the guidance of the higher-level student federation, our university has established a comprehensive Student Congress system. Serving as a vital bridge and bond between the university and its students, the Student Congress functions not only as a core mechanism for implementing campus democratic management and strengthening democratic oversight but also effectively facilitates regular communication channels between the university and its student body.

The 2024 Student Congress received 21 valid proposals. Among these, 6 proposals focused on teaching environment and service enhancement, while 8 centered on education and teaching improvements. Combined, these two categories accounted for 66% of all valid proposals. This data not only fully demonstrates students' high level of engagement with core campus development issues but also highlights the Student Congress's role as a key platform for in-depth communication between the university and its students regarding education and teaching initiatives.

The program has established a dedicated team-student communication mechanism. It regularly provides feedback to college student congress representatives regarding: The research/validation process and evaluation results of curriculum & talent cultivation plan revisions， Advancements and appropriateness of course content， Accuracy of educational objectives and rationality of curriculum structure， Identified issues with corresponding improvement measures. Relevant student congress documents are detailed in [Appendix 10-11].

The findings of the talent-cultivation evaluation are woven into Freshman Orientation Education ([Appendix 8]). During orientation, programme leaders lead an in-person briefing and open Q&A, guiding new students through the validation process and its outcomes while answering questions on the spot to foster a full and shared understanding of the programme's objectives and curriculum framework.

Current students may access their program's cultivation plan through the Academic Affairs Office website:https://jwc.sie.edu.cn

[figured removed]

Figure 5.1 Official Website Interface for Current Students to View the Curriculum Plan

Supporting Materials for R5: app. 10 and 11

R 6 (ASIIN 1.1, 1.3); Expert Feedback: It is recommended that the strategic orientation of the programme be further developed to enhance interdisciplinary learning experiences, including the design of electives that support cross-disciplinary competences.

School's Response: To strengthen the programme's strategic orientation, interdisciplinary learning is positioned as a core pillar of development and viewed as a critical pathway for cultivating well-rounded, future-ready graduates. Breaking down traditional disciplinary boundaries, the programme encourages cross-departmental collaboration in both teaching and learning, enabling academic resources and faculty expertise to work in synergy across subject areas.

The elective course system has been designed to systematically support the development of interdisciplinary competencies. On one hand, foundational theory courses such as Introduction to Power Engineering and Introduction to Energy Economics provide students with essential domain knowledge beyond their core discipline. On the other hand, a series of interdisciplinary practice-oriented electives is offered, many of which are built around real-world challenges or industry-sponsored projects. These courses encourage students to

integrate and apply knowledge from multiple fields to solve complex problems collaboratively.

Within the Computer Science and Technology programme, four specialised elective tracks have been developed to reflect emerging trends and application domains: Computer Vision for Power Systems, Embedded Application Technologies, Big Data and Artificial Intelligence, Quantum Cryptography. For details, refer to the elective module structure in [Appendix 8] (Curriculum Framework for the Class of 2025).

R 7. (ASIIN 1.3); Expert Feedback: It is recommended that the university consolidates its industry interface by involving students more directly in internships and practical training activities beyond the existing training centre.

School's Response: The college has signed cooperative agreements with more than 20 enterprises, 75% of which are high-tech companies, including North Laboratory, Huawei Technologies Co., Ltd., Liaoning Zhita Yunlian Technology Co., Ltd., NSFOCUS Technologies Group Co., Ltd., and Shenyang Jiayue Power Technology Co., Ltd. Selected cooperation agreements can be found in [Appendix 12].

For graduation projects, we implement a dual-supervisor system that combines industry needs with professional practice standards. Students work on real project cases or R&D topics to develop their ability to apply professional knowledge to solve practical problems. On-campus faculty supervisors are responsible for ensuring academic standards and achieving teaching objectives, while overseeing the coverage of professional knowledge and scientific research methodologies.

Supporting Materials for R7: app. 12

R 8. (ASIIN 1.3, 1.6, 3.1); Expert Feedback: It is recommended that the international orientation of the programme and the English language proficiency of both students and teachers be strengthened, e.g. through mandatory and regularly offered foundational-level English-taught courses, further exchange opportunities with Australia and Europe, and the integration of digital learning elements.

School's Response: Curriculum Development: Building a Strong Foundation for Internationalised Teaching

The School is actively developing English-medium core courses that combine subject knowledge with language skills. For example, Circuits II, a required course in the Computer

Science and Technology programme, is delivered entirely in English to strengthen both academic content and English proficiency. Bilingual resources—including textbooks and teaching materials—for key courses are under focused development, as outlined in [Appendix 13].

In addition, a faculty certification system for English-medium instruction (EMI) has been established. Dedicated training and workshops are offered to enhance instructors' intercultural competence and teaching effectiveness in international classrooms.

2. International Engagement: Creating Global Learning Opportunities

The School has launched joint undergraduate programmes with Murdoch University in Australia, offering 2+2 and 3+1 pathways. Plans are underway to expand these collaborations to include the Computer Science major. A dedicated scholarship fund supports semester-long overseas exchange opportunities, complemented by full-service guidance throughout the process.

International experts are regularly invited to deliver workshops and guest lectures. The School is also developing joint PhD programmes (including full four-year tuition scholarships), as well as structured summer research and academic exchange opportunities for undergraduates.

3. Digital Innovation: Advancing Internationalised Learning Models

An integrated online platform has been developed to support internationalised learning by providing access to global course content. Hybrid learning modules are being introduced to facilitate credit recognition across online and in-person delivery formats, as illustrated in Figure 8.1.

[figure removed]

Figure 8.1 International Resources for the Computer Multimedia Technology Course

Supporting Materials for R8: app. 13

R 9. (ASIIN 1.3, 2); Expert Feedback: It is recommended that modules on political education, military training, and ethics be retained as non-examined qualifying modules.

School's Response: Military training and ethics courses appear in our 2025 curriculum ([Appendix 8) as non-examinable courses rather than graded coursework.

R 10. (AISIN 1.6); Expert Feedback: It is recommended that the programme enhances practical learning experiences to better develop students' operational and professional competencies.

School's Response: The School has taken a multi-pronged approach to enhance the quality and relevance of practice-based learning:

1. Deepening University–Industry Collaboration. Standardised training centres have been co-established with leading industry partners, equipped to reflect real production environments. A "project-based learning" model has been adopted, in which students participate directly in tasks such as product development and equipment maintenance under the guidance of enterprise mentors. These experiences enable students to apply theoretical knowledge in practical, workplace-relevant settings.

2. Optimising the Practical Course Structure. The practical curriculum has been restructured into a three-tiered progression—basic operations, integrated training, and innovative application. The share of hands-on instruction has been significantly increased. Interdisciplinary practice modules have been introduced to help students develop broader competencies. Additionally, virtual simulation platforms are used to replicate high-cost or safety-critical operational scenarios in a controlled environment.

Enhancing the Assessment Framework for Practical Training. A multi-dimensional evaluation system has been implemented, combining continuous performance, final project review, and employer feedback. Key criteria include technical accuracy, problem-solving ability, and teamwork. A comprehensive course portfolio has been established to document learning outcomes—such as project deliverables, reports, and skill demonstrations—encouraging student ownership and supporting the development of strong professional capabilities.

[figure removed]

Figure 10.1University-Enterprise Cooperation Programs and Student Learning at Off-Campus Bases

R 11. (ASIIN 2); Expert Feedback: It is recommended that the exam grades are accompanied by formulated feedback for the students.

School's Response: The program has implemented an innovative "1+X" feedback mechanism to enhance student learning outcomes. This comprehensive model combines one summative evaluation at the course conclusion with multiple formative assessments throughout the learning process. The terminal feedback provides a holistic assessment of

students' overall performance, while the ongoing formative evaluations - conducted after each instructional unit and key learning activities - offer timely identification of learning gaps. This dual approach enables continuous improvement by allowing students to promptly recognize and address deficiencies.

For practical implementation, instructors utilize an intelligent course platform to distribute assignments, provide real-time grading feedback (as shown in Figure 11.1), and generate early warning alerts for students demonstrating academic difficulties. The system's automated monitoring function produces risk lists to facilitate targeted faculty intervention, ensuring timely support for struggling learners.

[figure removed]

Figure 11.1 Example of Assignment Grading Feedback

Our university is establishing student learning growth portfolios: Through the smart teaching platform, we will record every detail of students' learning process, generate personalized learning competency profiles, and provide systematic feedback. This feedback will then be transformed into tangible progress, helping students gain comprehensive self-awareness and continuously improve their learning effectiveness.

R 12. (ASIIN 3.1); Expert Feedback: It is recommended to further increase the academic qualification level of the teaching staff by supporting PhD qualification efforts.

School's Response: Within this academic program's faculty, 4 individuals are currently pursuing doctoral degrees. This year, one faculty member commenced doctoral studies, another has applied for doctoral studies abroad, and two doctoral degree holders have been newly recruited. This program is consistently committed to increasing the proportion of faculty holding doctoral degrees. Please refer to [Appendix 14] .

Supporting Materials for R12: app. 14

R 13. (ASIIn 3.1); Expert Feedback: It is recommended to introduce an in-house continuing professional development programme for teaching staff.

School's Response: The School actively supports faculty development through multiple pathways tailored to both academic growth and institutional needs. Staff members are encouraged to pursue doctoral studies while in post, with institutional policies in place to accommodate part-time doctoral training.

In addition, faculty are regularly sponsored for domestic and international academic exchange programmes, including visiting scholar appointments at leading universities and research institutes, based on departmental recommendations and university-level approval procedures (see [Appendix 15]). Participation in academic conferences, specialised training, and teaching-focused workshops is also an integral part of continuous professional development.

Supporting Materials for R13: app. 15

R 14. (ASIIN 5); Expert Feedback: It is recommended that the QA processes and instruments in place should be formalized.

School's Response: Guided by the core principles of Outcome-Based Education (OBE), the university has systematically strengthened its quality assurance framework with a clear emphasis on student-centred learning, results-driven delivery, and continuous improvement. A comprehensive set of policy documents (see [Appendix1–3, 16–18]) has been developed to support this effort. These documents provide an integrated framework that governs all aspects of the educational process—from strategic design to operational execution.

By clearly defining learning outcomes, standardising procedures, and refining evaluation mechanisms, the system ensures that every stage of teaching and learning remains focused on student competence development and outcome achievement. This full-cycle approach lays a solid institutional foundation for the continuous enhancement of programme quality.

Supporting Materials for R14: app. 16, 17, and 18

F Summary: Expert recommendations (14.08.2025)

Taking into account the additional information and the statement given by Shenyang Institute of Engineering, the experts summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Computer Science and Technology	With requirements for one year	30.09.2031	–	-

Requirements

A 1. (ASIIN 1.3) It is required that the university establishes a mechanism that reliably ensures the continuous updating of foundational courses to meet future knowledge requirements and developments in emerging fields.

A 2. (ASIIN 1.3) It is required to align the coursework and project work with the intended learning outcomes of the respective module, particularly in applied and interdisciplinary contexts.

A 3. (ASIIN 1.4) It is required that the university establishes and implements rules for the recognition of qualifications achieved externally to facilitate the transition between higher education institutions and with non-university places of learning.

A 4. (ASIIN 1.5) It is required to establish and implement a mechanism to monitor student workload on a regular basis in order to identify and rectify discrepancies between credit point allocation and workload estimation, if necessary.

A 5. (ASIIN 5) It is required that the university informs students of results and resulting changes of programme and course evaluations.

Recommendations

E 1. (ASIIN 1.1 & 1.3) It is recommended that the strategic orientation of the programme be further developed to enhance interdisciplinary learning experiences, including the design of electives that support cross-disciplinary competences.

E 2. (ASIIN 1.3) It is recommended that the university consolidates its industry interface by involving students more directly in internships and practical training activities beyond the existing training centre.

E 3. (ASIIN 1.3 & 3.1) It is recommended that the international orientation of the programme and the English language proficiency of both students and teachers be strengthened, e.g. through mandatory and regularly offered foundational-level English-taught courses, further exchange opportunities with Australia and Europe, and the integration of digital learning elements.

E 4. (ASIIN 1.3 & 2) It is recommended that modules on political education, military training, and ethics be retained as non-examined qualifying modules.

E 5. (ASIIN 2) It is recommended that the exam grades are accompanied by formulated feedback for the students.

E 6. (ASIIN 3.1) It is recommended to introduce an in-house continuing professional development programme for teaching staff.

E 7. (ASIIN 5) It is recommended that the QA processes and instruments in place should be formalized.

G Comment of the Technical Committee 04 – Informatics/Computer Science (28.11.2025)

Assessment and analysis for the award of the ASIIN seal:

The TC discusses the procedure and, in particular, the expert panel's requirement A 1. The TC does not agree with the formulated requirement, as according to the report, a mechanism for updating the curriculum already exists: minor updates every two years and major updates every four years. In the opinion of the TC, this frequency is generally sufficient to keep the curriculum up to date. The TC understands the report to mean that more current topics should also be addressed in the foundation courses, but that there is no systematic problem with further development and that the content taught corresponds to the intended learning objectives. It is therefore more a matter of ensuring that even in the foundational courses, which generally cover content that does not change too quickly, references to up-to-date topics are also made. The TC therefore argues in favor of converting the requirement into a recommendation (now E 3). Otherwise, the TC follows the experts' assessment without any changes.

The Technical Committee 04 – Informatics/Computer Science recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Computer Science and Technology	With requirements for one year	30.09.2031	–	-

Requirements

A 1. (ASIIN 1.3) It is required to align the coursework and project work with the intended learning outcomes of the respective module, particularly in applied and interdisciplinary contexts.

A 2. (ASIIN 1.4) It is required that the university establishes and implements rules for the recognition of qualifications achieved externally to facilitate the transition between higher education institutions and with non-university places of learning.

A 3. (ASIIN 1.5) It is required to establish and implement a mechanism to monitor student workload on a regular basis in order to identify and rectify discrepancies between credit point allocation and workload estimation, if necessary.

A 4. (ASIIN 5) It is required that the university informs students of results and resulting changes of programme and course evaluations.

Recommendations

E 1. (ASIIN 1.1 & 1.3) It is recommended that the strategic orientation of the programme be further developed to enhance interdisciplinary learning experiences, including the design of electives that support cross-disciplinary competences.

E 2. (ASIIN 1.3) It is recommended that the university consolidates its industry interface by involving students more directly in internships and practical training activities beyond the existing training centre.

E 3. (ASIIN 1.3) It is recommended to update the content of the foundational courses regarding latest developments in emerging fields.

E 4. (ASIIN 1.3 & 3.1) It is recommended that the international orientation of the programme and the English language proficiency of both students and teachers be strengthened, e.g. through mandatory and regularly offered foundational-level English-taught courses, further exchange opportunities with Australia and Europe, and the integration of digital learning elements.

E 5. (ASIIN 1.3 & 2) It is recommended that modules on political education, military training, and ethics be retained as non-examined qualifying modules.

E 6. (ASIIN 2) It is recommended that the exam grades are accompanied by formulated feedback for the students.

E 7. (ASIIN 3.1) It is recommended to introduce an in-house continuing professional development programme for teaching staff.

E 8. (ASIIN 5) It is recommended that the QA processes and instruments in place should be formalized.

H Decision of the Accreditation Commission (12.12.2025)

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

The Accreditation Commission discussed the change proposed by the Technical Committee 04 to convert requirement A1 into a recommendation and follows the TC's argumentation to do so. Moreover, the Accreditation Commission decided to remove the (former) recommendations E4 and E5. Regarding E4, the inclusion of non-discipline courses such as military training and political education into the final grade, the Commission will discuss how such cases shall be handled uniformly in the future. Therefore, the Commission refrains from issuing a recommendation in this specific case and refers to its future discussion and subsequent decision. Regarding E5, the Accreditation Commission argued that such qualitative feedback is not strictly necessary and therefore decided to remove this recommendation. In all other requirements and recommendations, the Accreditation Commission follows the suggestions by the Technical Committee.

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 Computer Science and Technology	With requirements for one year	30.09.2031	–	-

Requirements

A 1. (ASIIN 1.3) It is required to align the coursework and project work with the intended learning outcomes of the respective module, particularly in applied and interdisciplinary contexts.

A 2. (ASIIN 1.4) It is required that the university establishes and implements rules for the recognition of qualifications achieved externally to facilitate the transition between higher education institutions and with non-university places of learning.

A 3. (ASIIN 1.5) It is required to establish and implement a mechanism to monitor student workload on a regular basis in order to identify and rectify discrepancies between credit point allocation and workload estimation, if necessary.

A 4. (ASIIN 5) It is required that the university informs students of results and resulting changes of programme and course evaluations.

Recommendations

E 1. (ASIIN 1.1 & 1.3) It is recommended that the strategic orientation of the programme be further developed to enhance interdisciplinary learning experiences, including the design of electives that support cross-disciplinary competences.

E 2. (ASIIN 1.3) It is recommended that the university consolidates its industry interface by involving students more directly in internships and practical training activities beyond the existing training centre.

E 3. (ASIIN 1.3) It is recommended to update the content of the foundational courses regarding latest developments in emerging fields.

E 4. (ASIIN 1.3 & 3.1) It is recommended that the international orientation of the programme and the English language proficiency of both students and teachers be strengthened, e.g. through mandatory and regularly offered foundational-level English-taught courses, further exchange opportunities with Australia and Europe, and the integration of digital learning elements.

E 5. (ASIIN 3.1) It is recommended to introduce an in-house continuing professional development programme for teaching staff.

E 6. (ASIIN 5) It is recommended that the QA processes and instruments in place should be formalized.

Appendix: Learning objectives and curricula

Learning objectives

The SAR references the website https://xxxy.sie.edu.cn/ASIIN/Objectives.htm on which the learning objectives are listed that graduates of the Computer Science and Technology bachelor are expected to achieve withing five years of graduation. The objectives are:

1. Consciously practice the core socialist values, possess excellent humanistic and social science literacy, a sense of patriotism, a sound personality, a high degree of social responsibility and mission. They can adhere to professional ethics, laws, and regulations in engineering practices within the computer and related fields.

2. Adapt to the development of the computer and related fields, possess the professional qualities of an engineer, and be capable of independently undertaking the design and development of small - and medium - sized projects in the computer and related fields, as well as in the energy & power field. They can be competent as software development engineers, mobile application development engineers, system engineers, system maintenance engineers, etc.

3. Have innovative capabilities. In engineering practices within the computer and related fields, they can comprehensively consider factors such as society, law, safety, environment, health, culture, and sustainable development. They are able to make rational judgments, evaluations, and optimal selections of solutions in the system design, development, testing, deployment, and application within the computer and related fields.

4. Possess strong communication and expression skills, have certain coordination, management, and cooperation abilities, play an effective role in a team, and serve as technical backbones of the team.

5. Have an international perspective, be able to actively adapt to the ever - changing domestic and international situations and environments. They can update their knowledge and overcome difficulties through various learning channels, form the habit of autonomous and lifelong learning, and continuously enhance their personal capabilities and technical levels.

Furthermore, there are learning objectives for each course, listed in the teaching syllabus (app. 08-01). See attached here the learning objectives of the course College Physics, which is taught in the second semester, as an example:

Objectives of the Module/Expected Learning Outcomes	*Course Objective 1: Correctly expound the basic concepts and theories of physics. Be able to apply basic concepts such as position vector, velocity, acceleration, displacement and distance, momentum, and kinetic energy. According to the characteristics, nature and actual situation of physical problems, establish corresponding physical models, and describe them in physical language and basic mathematical methods.* *Course Objective 2: Be able to identify, judge and express the key technical links and parameters of complex engineering problems. By selecting appropriate mathematical models, describe a complex mechanical system or process. Apply the physical laws involved in kinematics, dynamics, the laws of conservation of momentum and energy, the law of fixed-axis rotation of a rigid body, and the law of conservation of mechanical energy, etc., to conduct rigorous analysis, reasoning and solution for the correctness of the model.* *Course Objective 3: Be able to apply the law of energy conversion and conservation, the first law of thermodynamics, the second law of thermodynamics, the Carnot cycle and efficiency to analyze and understand the impacts of electromechanical products and energy equipment on the environment and social sustainable development in the design, production and use stages.*

Curriculum

As the university has not presented an overview of a modular curriculum, the course schedule (app. 07-01) is attached here. “Teach Class” in the table refers to the in-class hours, “Experiment” and “Computer Practice” refer to the lab/experiment hours, “Study on Ones” refers to the self-study hours, and “School Begins” refers to the semester in which students take the course in question:

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
1	obligatory	foreign language	10001115	College English (1)	Lecture	3	3.5	48			57	examination	I
2	obligatory	liberal education	13001101	Sports (1)	Lecture	1	1.5	24			21	examination	I
3	obligatory	Fundamentals of Mathematics and Natural Sciences	11001116	Advanced Mathematics (1)	Lecture	4.5	7	72			138	examination	I
4	obligatory	engineering foundation	4112111	Digital Electronic Technology	Lecture&Practice	2.5	3	38	10		42	examination	I
5	obligatory	engineering foundation	1000002	Circuit (2)	Lecture&Practice	3	4	42	6		72	examination	I
6	obligatory	engineering foundation	4112101	Introduction to Computer Science	Lecture	1.5	2	24			36	examination	I
7	obligatory	engineering foundation	04002164	C language programming	Lecture&Practice	3.5	4.5	48		16	71	examination	I
8	obligatory	liberal education	99005103	health education	Lecture	1	1.5	20			25	examination	I
9	obligatory	Concentrated practice	04004303S	Practice of C Programming Language	Practice	1	2	30			30	examine	I
10	obligatory	Concentrated practice	04004204S	Cognition Internship of Computer	Practice	1	2	30			30	examine	I
total					22	31	376	16	16	522			
11	obligatory	liberal education	9001101	Ideological and Moral Cultivation and Laws and Regulations	Lecture	3	3.5	48			57	examination	II

0 Appendix: Learning objectives and curricula

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
12	obligatory	foreign language	10001121	College English Listening and Speaking (2)	Lecture	2	2.5	32			43	examination	II
13	obligatory	foreign language	10001122	College English Reading and Writing (2)	Lecture	2	2.5	32			43	examination	II
14	obligatory	liberal education	13001102	Sports (2)	Lecture	1	1.5	32			13	examination	II
15	obligatory	Fundamentals of Mathematics and Natural Sciences	11001124	Advanced Mathematics (2)	Lecture	6	8	96			144	examination	II
16	obligatory	Fundamentals of Mathematics and Natural Sciences	11001130	Linear Algebra	Lecture	3	4.5	48			87	examination	II
17	obligatory	Fundamentals of Mathematics and Natural Sciences	11001143	Discrete Mathematics	Lecture	3	4.5	48			87	examination	II
18	obligatory	Fundamentals of Mathematics and Natural Sciences	11001127	College Physics	Lecture	5	7.5	80			145	examination	II
19	obligatory	liberal education	99005101	Psychological Health and Adjustment	Lecture	1	1	20			10	examination	II
20	obligatory	engineering application	4112452	C++Programming	Lecture&Practice	2	2.5	26		12	37	examination	II
21	obligatory	liberal education	99005102	Military Doctrine	Lecture	0.5	1	12			18	examination	II
22	obligatory	Concentrated practice	14002106S	Electronic Process Practice	Practice	1	2	30			30	examine	II

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
23	obligatory	Concentrated practice	04114301S	Practice of C++ Programming Language	Practice	2	3	60			30	examine	II
total					31.5	44	564	0	12	744			
24	obligatory	liberal education	9001102	Outline of Modern Chinese History	Lecture	2	2.5	32			43	examination	III
25	obligatory	foreign language	10001123	College English Listening and Speaking (3)	Lecture	2	2.5	32			43	examination	III
26	obligatory	foreign language	10001124	College English Reading and Writing (3)	Lecture	2	2.5	32			43	examination	III
27	obligatory	liberal education	13001103	Sports (3)	Lecture	1	1.5	32			13	examination	III
28	obligatory	Fundamentals of Mathematics and Natural Sciences	11001131	Probability Theory and Mathematical Statistics	Lecture	3	4.5	48			87	examination	III
29	obligatory	Fundamentals of Mathematics and Natural Sciences	11001127S	Physical Experiment	Practice	1	1		20		10	examination	III
30	obligatory	liberal education	11001128	Language Arts and Applied Writing	Lecture	2	2	32			28	examination	III
31	obligatory	engineering foundation	04002108	Data Structure	Lecture&Practice	3.5	4.5	44		12	79	examination	III
32	obligatory	engineering foundation	4002103	Principle of Computer Organization	Lecture&Practice	3	4	40	8		72	examination	III
33	obligatory	liberal education	99005104	Retrieval of Scientific and Technical	Lecture	0.5	1	12			18	examination	III

0 Appendix: Learning objectives and curricula

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
				Documents									
34	obligatory	Concentrated practice	09001111S	Practice of Outline of Modern and Contemporary Chinese History	Practice	1	2	30			30	examine	III
35	obligatory	Concentrated practice	04114337S	Training of Web Page Design and Production Technology	Practice	1	2	30			30	examine	III
36	obligatory	Concentrated practice	04004335S	Practice of Algorithm and Structure Design	Practice	2	3	60			30	examine	III
	total					24	33	424	28	12	526		
37	obligatory	liberal education	9001115	Situation and Policy	Lecture	1	1.5	32			13	examination	I-IV
38	obligatory	liberal education	9001103	Basic Principles of Marxism	Lecture	3	3.5	48			57	examination	IV
39	obligatory	foreign language	10001125	College English Listening and Speaking (4)	Lecture	2	2.5	32			43	examination	IV
40	obligatory	foreign language	10001126	College English Reading and Writing (4)	Lecture	2	2.5	32			43	examination	IV
41	obligatory	liberal education	13001104	Sports (4)	Lecture	1	1.5	32			13	examination	IV
42	obligatory	engineering foundation	04002234	Database Principle and Application	Lecture&Practice	3	4	40		8	72	examination	IV
43	obligatory	engineering application	04002251	Operating System	Lecture&Practice	3.5	4.5	40		16	79	examination	IV
44	obligatory	engineering	4002211	Microcomputer principle	Lecture&Pr	3	4	36	12		72	examination	IV

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
		application		and application	actice								
45	obligatory	engineering application	04002235*	Java Programming	Lecture&Practice	3	4	28		20	72	examination	IV
46	obligatory	liberal education	99005107	Introduction to Energy and Power Engineering	Lecture	1	1.5	16			29	examination	IV
47	obligatory	liberal education	99005109	Introduction to Engineering Ethics	Lecture	0.5	1	16			14	examination	IV
48	obligatory	Concentrated practice	04004336S	Practice of Microcomputer System Design	Practice	1	2	30			30	examine	IV
49	obligatory	Concentrated practice	04004338S	Practice of Java Programming	Practice	2	3	60			30	examine	IV
total					26	35.5	442	12	44	567			
50	obligatory	Concentrated practice	09001110S	Social Practice of the Course "An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics"	Practice	1	2	30			30	examine	V
51	obligatory	engineering application	04002214	computer network	Lecture&Practice	3	4	40	8		72	examination	V
52	obligatory	engineering application	4002236	Web Programming	Lecture&Practice	3	4	28		20	72	examination	V
53	obligatory	engineering	4002255	Principles and	Lecture&Pr	3.5	4.5	44	12		79	examination	V

0 Appendix: Learning objectives and curricula

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
		application		Applications of Embedded System	actice								
54	obligatory	engineering application	04002239	software engineering	Lecture&Practice	3	4	40		8	72	examination	V
55	obligatory	Concentrated practice	04004342S	Practice of Embedded System Design	Practice	2	3	60			30	examine	V
56	obligatory	Concentrated practice	04002215S	Training of Computer Network Technology	Practice	2	3	60			30	examine	V
57	obligatory	Concentrated practice	04002236S	Practice of Web Programming	Practice	1	2	30			30	examine	V
total					18.5	26.5	332	20	28	415			
58	obligatory	liberal education	9001104	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	Lecture	4	4.5	64			71	examination	V,VI
59	obligatory	engineering application	3032310	power engineering	Lecture	2.5	3.5	40			65	examination	VI
60	obligatory	engineering application	4112302	Network equipment management and maintenance	Lecture&Practice	1.5	2	12		12	36	examination	VI
61	obligatory	Concentrated practice	04114246S	Practice of Software Project Development and Design	Practice	2	3	60			30	examine	VI
total					10	13	176	0	12	202			

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
62	take as an elective	Self-development	4153154	Computer Multimedia Technology	Lecture&Practice	3	4	30		18	72	examine	IV
63	take as an elective	Self-development	4753184	Microcontroller Technology and Applications	Lecture&Practice	2	2.5	24	8		43	examine	IV
64	take as an elective	Self-development	4003107	Principles and Applications of Cloud Computing	Lecture&Practice	3	4	30		18	72	examine	V
65	take as an elective	Self-development	4123122	Database Technology	Lecture&Practice	2	2.5	18		18	39	examine	V
66	take as an elective	Self-development	4113128	Network Security Principles	Lecture&Practice	2	2.5	30	6		39	examine	VI
67	take as an elective	Self-development	4112301	Linux Operating System Usage and Maintenance	Lecture&Practice	2.5	3.5	20		20	65	examine	VI
68	take as an elective	Self-development	4113131	Embedded Systems Development	Lecture&Practice	2.5	3.5	30	10		65	examine	VI
69	take as an elective	Self-development	4113127	Professional Foreign Language	Lecture	2	2.5	36			39	examine	VI
70	take as an elective	Self-development	4003102	C# Programming	Lecture&Practice	3	4	24		24	72	examine	VI
71	take as an elective	Self-development	4113108	Network Service Management and Maintenance	Lecture&Practice	1.5	2	12		12	36	examine	VII
72	take as an elective	Self-development	4123126	Hacking and Defence	Lecture&Practice	1.5	2	12		12	36	examine	VII

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
73	take as an elective	Self-development	4113109	Compile system	Lecture&Practice	3	4	42	6		72	examine	VII
74	take as an elective	Self-development	4003110	Python Programming	Lecture&Practice	2.5	3.5	24		16	65	examine	VII
total					6	10	86	0	38	176			
75	obligatory	engineering application	4112501	mobile application development	Lecture&Practice	2	2.5	18		18	39	examination	VII
76	obligatory	Concentrated practice	04114311S	Practice of Mobile Application Development	Practice	1	2	30			30	examine	VII
77	obligatory	Concentrated practice	04114247S	Development of Energy and Electric Power Application System	Practice	3	5	90			60	examine	VII
78	obligatory	Concentrated practice	04114148S	Practical Training of Enterprise Project Development and Design	Practice	3	5	90			60	examine	VII
79	obligatory	Concentrated practice	09001115S	Situation and Policy (Practice)	Practice	1	2	30			30	examine	V-VII
80	obligatory	liberal education	99005106	Employment and Entrepreneurship Guidance	Lecture	1	1.5	32			13	examination	I,III,V, VII
total					11	18	290	0	18	232			
81	obligatory	Concentrated practice	04114149S	Graduation Internship	Practice	3	5	90			60	examine	VIII

Order Number	Curriculum System	Course Category	Course Code	Course Title	Type	Chinese Credit	ECTS Credit	Teach Class	Experiment	Computer Practice	Study on Ones	Examine Way	School Begins
82	obligatory	Graduation thesis/design	04114150S	Graduation Project	Practice	14	18	420			120	examine	VIII
83	obligatory	liberal education		Natural Science Courses/Humanities and Social Sciences Courses/Economics and Management Courses	Lecture	2	3	32			58	examination	I-VIII
84	obligatory	liberal education		Art courses	Lecture	2	3	32			58	examination	I-VIII
total					21	29	574	0	0	296			
Amount to					170	240	3264	76	180	3680			

Note: Most of the Self - development courses are in the 6th semester, so their class hours and credits can be counted together.。