ASIIN Seal and Euro-Inf® Label

Accreditation Report

Bachelor's Degree Programme
Computer Engineering
Network Engineering
Intelligent System Engineering

Provided by
University of Science and Technology Shanghai

Version: 20 March 2020

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
计算机科学与技术	Computer Engineering	ASIIN	Euro-Inf®	04
网络工程	Network Engineering	ASIIN	Euro-Inf®	04
智能科学与技术	Intelligent System Engineering	ASIIN	Euro-Inf®	04
Date of the contract: 09.09.2016 **Submission of the final version of the self-assessment report:** 05.05.2019 **Date of the onsite visit:** 30.10.2019 **at: USST Shanghai**				
Peer panel: Prof. Dr. Bettina Harriehausen-Mühlbauer, University of Applied Sciences Darmstadt; Prof. Dr. Helena Szczerbicka, Leibniz University Hannover; Uwe Sesztak, Marco Systems Shun Feng, Tongji University Shanghai				
Representative of the ASIIN headquarter: Dr. Martin Ferster				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				

[1] ASIIN Seal for degree programmes; Euro-Inf®: Label European Label for Informatics.
[2] TC: Technical Committee for the following subject areas: TC 04 - Informatics/Computer Science.

Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria, as of 10.03.2015 Subject-Specific Criteria of Technical Committee 04 - Informatics as of 29.03.2018	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Computer Engineering	B.Eng.	-	6	Full time	-	8 Semester	240 ECTS	Fall semester / 01.09.1977
Network Engineering	B.Eng.	-	6	Full time	-	8 Semester	240 ECTS	Fall semester / 01.09.2005
Intelligent System Engineering	B.Eng.	-	6	Full time	-	8 Semester	240 ECTS	Fall semester / 01.09.2010

For the Bachelor's degree programme Computer Engineering the institution has presented the following profile in the self-assessment report:

„The aim of computer science and technology is to combine the application of computer science and computer engineering. Through the systematic theory study and the engineering practice training, the students are trained with the good synthesis quality and the knowledge structure, systematically knowledge in the computer science theory and the computer application, advanced engineering and technical talents with problem analysis and problem solving ability and innovation ability in this field. The graduates can be engaged in teaching, scientific research, operation management, technology development and other fields in the computer industry and related fields. They can also pursue further studies in their major and other relevant specialties, and be qualified for all kinds of employment positions related to their major and knowledge, and has good academic ability and personal development prospects.

Students of this major should acquire knowledge of natural science, humanities and social sciences in the course of four years studies, master knowledge and techniques in computer

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

system, network and system, software engineering and software design, computer application technology, data processing and analysis and so on. The emphasis is placed on cultivating students comprehensive quality, actively promoting the overall improvement comprehensive quality, realizing the integration of science education and humanities education, and possessing good professional ethics. The graduates master the basic methods of computer system analysis and design, have certain technical management and independent working ability, are able to solve research and engineering problems in computer software, hardware and application, and have the ability to learn a new theory of computer science and developing technologies and the ability to gain independent access to knowledge and information."

For the Bachelor's degree programme Network Engineering the institution has presented the following profile in the self-assessment report:

„The students of network engineering program learn mathematics, natural science, humanities, social Sciences, and other basic knowledge together with computer network, network engineering, computer technology, internet of things, network software development and network management expertise for network design, network programming and network operation and maintenance and other technologies. The characters of this program are international, engineering and adaptive to a wide range of professions. Through systematic theoretical study and engineering practice training, we train senior engineering and technical personnel in network engineering design and management, internet of things, network software development, network operations and maintenance in areas such as research and development, production and operation, organization and management.

In four years of study, students have a solid basic knowledge of mathematics, natural sciences, humanities and social sciences. They will have a wide range of professional foundation and professional knowledge in this field. They will have the engineering practice training in this field and have basic capabilities in computer network, network engineering, computer technology, Internet of things, network software development and network operation and maintenance. They will understand network engineering frontier and development trend. They should pass the CET-4 and can read the professional English literature and therefore have strong ability to communicate in English. They will have the teamwork spirit and enterprise management capabilities. Students can integrate the knowledge they learn, have a strong ability to solve practical problems of various types of network engineering, be competent in all kinds of jobs related to their major and knowledge, and have good academic abilities and personal development prospects."

For the Bachelor's degree programme Intelligent System Engineering the institution has presented the following profile in the self-assessment report:

„For intelligent System Engineering major, the students can learn basic knowledge such as mathematics, natural science, humanities and social sciences, data structure, principle of single chip computer, automatic control principle, artificial intelligence, intelligent simulation, intelligent information processing, machine vision and other professional knowledge to solve complex engineering problems in intelligent systems. The major has the characteristics of internationality, engineering and wide adaptability. Through systematic theoretical study and engineering practice training, the students can become senior engineers and technicians engaged in research and development, production operation and organization management in the fields of intelligent system design and management, robot technology and development, intelligent algorithm, machine vision and so on are trained.

Students of this major should acquire solid and interdisciplinary professional basic knowledge in the fields of intelligent science and technology, such as mathematics, computer, electronic information technology, etc. During the four-year study process, student have the ability to understand, analyze, compare, generalize, demonstrate and judge the problems of intelligent science system engineering; understand the frontier and development trend of intelligent science and technology; CET-4, proficient in reading professional English literature, strong English communication skills, team work and enterprise production management capabilities. Students are able to integrate their learning knowledge, have a strong ability to solve practical problems of various network engineering, be competent for all kinds of employment positions related to their majors and knowledge, and have good academic ability and personal development prospects.“

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report
- Objectives-Module Matrices
- Appendix O: Diploma Supplement
- On-Site Discussions

Preliminary assessment and analysis of the peers:
For the degree programmes under review, the HEI presents an extensive description of learning outcomes in the self-assessment report (SAR). This description is accompanied by learning module matrices for each programme, matching learning objectives, modules and the ASIIN Subject-Specific Criteria (SSC). A short English description of the learning outcomes is also presented in the exemplary Diploma Supplement for the Computer Engineering as well as Intelligent System Engineering. No Diploma Supplement was yet provided for the Network Engineering programme. In any case, the peers ask that a Diploma Supplement outline the subject-specific learning outcomes to be provided in the aftermath of the site visit.

From the documentation, the peers gather the impression that the three programmes have a common origin in the traditional Computer Engineering programme. As this programme has been running since 1977, it is apparent that the more specialized programmes in Network Engineering and Intelligent System Engineering are later creations based on specializations of the original programme. Thus, they can clearly see that the defined learning outcomes of all three degree programmes are very much the same. For each programme the coordinators have defined a set of 6 programme learning outcomes based on knowledge,

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

skills and competencies: Basic scientific literacy and engineering capabilities, professional competence and capabilities, engineering thinking and practice ability, capability in international communication, team-work and management capabilities and the consciousness and ability of life-long learning. Under each of the six learning outcomes, three more detailed aspects have been defined. The peers appreciate this logical approach and recognize that all students of the three programmes are supposed to gain a basic understanding of mathematics and natural sciences, develop critical analytical thinking towards fundamental problems and have basic knowledge and skills in order to solve engineering problems. Further, they shall be able to find, read and understand subject-specific literature in Chinese and English, debate engineering problems in teams and present their results to an interested audience in oral as well as written form. In addition, graduates should possess a good legal awareness of the problems resulting from their professional actions and a sense of social responsibility. After the completion of the programmes, graduates should thus be able either to take up a professional position in the industry or to continue their academic career on a Master's level.

While the peers agree that the described learning outcomes adequately reflect the expected body of knowledge and skills of graduated in any Bachelor level Computer Science programme they miss a sufficiently clear outline of the subject-specific learning outcomes that differentiate the three programmes under review. From the documents provided, it did not become entirely clear where the learning outcomes of the programmes differ and thus, what qualifications graduates possess that they do not acquire in the other two respective programmes.

From the discussions on-site and information provided during the visit the peers understand that the programme in Computer Engineering has a clear focus on Software development and engineering and consequently is primarily targeting a profound programming education. Hardware applications are also part of the programme and are reflected in modules such as Circuits Principle, Digital Circuits or Embedded Systems, but these are not the core focus. The peers appreciate this clarification and have no doubt that the profile of the programme is suitable in order to provide students with good job opportunities.

The focus of the Network Engineering programme lies on providing students with basic knowledge in networks and networks engineering, especially the aspects of requirement analysis, design of network protocols and the software development and testing technique in network applications. Furthermore, students shall have the opportunity to specialize in different areas such as network operation and maintenance, network programming and embedded wireless networks. These explanations help to better understand what the programme aims at and where it differs from the Computer Engineering programme.

In Intelligent System Engineering, the special focus lies on algorithms of machine learning and their applications, such as object recognition, machine vision, text learning, intelligent information retrieval and image processing. Furthermore, students shall gain competencies in the field of Intelligent Inspection and Motion Control with aspects such as intelligent motion and robot control in industry and autonomous mobile robot control and guidance.

From the information provided on-site the peers could see that each of the programmes possess a clearly defined set of learning outcomes while in all programmes students are trained in the common aspects of Computer Science as well as scientific research. In conclusion, they agree that all programmes adequately reflect the professional as well as academic requirements of the subject and comply with the expectations of the European Framework Level 6 (equivalent to Bachelor degree programmes) as well as the respective Subject-Specific Criteria of the ASIIN Technical Committee 04 – Informatics. Thus, they also comply with the Criteria for programmes of Computer Science of EQANIE and qualify for the award of the Euro-Inf Label. However, the peers emphasize that the differentiated learning outcomes need to be revised based on the information provided during the site visit and that these revised learning outcomes have to included in the respective Diploma Supplement in order to ensure transparency towards the students and employers.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report
- On-Site Discussions

Preliminary assessment and analysis of the peers:
The peers generally agree, that the names of the degree programmes adequately reflect the respective aims, learning outcomes and curricula. Only in the case of the Computer Engineering programme they discuss with those responsible if the name is actually fitting the current content. Since the focus of the programme has shifted in the past years towards a more Software-oriented programme it might be argued that the title of Computer Engineering could be misleading and that a designation such as Software Engineering or simply Computer Science would be more to the point. However, as the peers understand, the name of the degree programmes is usually defined by the government and cannot be changed easily and since the name is not entirely wrong, they do not see the necessity to change something immediately.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Appendix C: Curricula
- Appendix D: Module Handbooks
- On-Site Discussions

Preliminary assessment and analysis of the peers:

The panel reviewed the curricula of the study programmes under consideration in order to identify whether the available modules can achieve the described learning objectives. This was done through the discussions on-site, the matrices matching the general learning objectives and the module contents as well as the module descriptions. From the discussions with the stakeholders, the peers understand that the curricula of all programmes are part of a constant review process in order to ensure that they meet the requirements of the industry and the government. Since a special focus of the programmes at USST lies on the practical experience and application of skills and knowledge, at least 25% of all curricula have to be practice-related.

All three curricula comprise modules of six different categories, chiefly related to the previously defined learning outcomes. With the programmes themselves being related to each other in the main core areas, the distribution of these six blocks within the curricula is identical. Therefore, all students have to take 36 ECTS credits from Fundamental Theory (mostly Mathematics), 44 credits from Professional Foundation, 50 credits from Engineering Capabilities, 12 credits in English language, 30 credits in Soft Skills and 68 credits in Engineering practice including 25 credits for an internship and 25 credits for the so-called Graduation Project. The Soft Skills also include several mandatory courses defined by the Chinese government such as Chinese History, Principle of Marxism, Socialist Theory, Military Knowledge and Training and Physical Education. These compulsory courses are a major reason for the fact the Bachelor degree programmes in China last eight instead of six semesters. The additional two semesters include only little space for more subject-specific content. Consequently, the subject-specific modules are distributed through the third until the sixth semester, the final year being reserved for internships and graduation project. While all programmes share certain modules related to general Computer Science (C Programming and Practice, Object Oriented Programming, Operating System, Java Programming, Digital Circuits and Data Structures), the programmes also provide modules related to their special focus areas. In Computer Engineering students take among others Introduction to Computer Engineering, Software Engineering and Database Principles, in Network Engineering all students have to take Introduction to Network Engineering, Routing and

Switching and Internet Protocol Analysis and in Intelligent System Engineering the courses Introduction to Intelligent Engineering, Artificial Intelligence and Digital Signal Processing are mandatory.

While the peers agree that the fundamentals of Computer Science are well represented within each of the curricula and that certain essentials of the focus areas are also reflected within the respective programme structures, they also point to the fact that some modules elementary for the specializations are only represented in the elective areas. In each programme students have to take 30 credits from the field of Engineering Capabilities. These are divided into two blocks of 15 credits that can be chosen among six offered modules each. Although the peers highly appreciate this elective option for the students, they argue that depending on the individual choices some very important modules could be left out of the curriculum. In the case of Computer Engineering, for example, the module Algorithm Design and Analysis is only an elective, which is astonishing since the programme coordinators emphasize the programme's focus on software design. The peers recommend to review the curricula in this context and to make sure that those courses essential for the respective special focus of the programme are compulsory for all students. A second issue identified by the peers relates to project management skills. They agree with the programme coordinators that all students should obtain a certain competence in project management but realize that there is no such module in the Intelligent System Engineering curriculum. On the other hand, the other two programmes have even two modules related to project management of five credits each. With a view to the previously outlined recommendation to make some of the elective courses mandatory it could be a solution to reduce the project management to just one course and thus gain free space for another compulsory module. In addition, the peers remark that the curricula do not include courses touching questions of ethics in Computer Science. Despite the class on "Morality and Law" which is available in the soft skills section there is yet little to be found on the subject. The peers emphasize the growing importance of this topic especially in the context of Artificial Intelligence and recommend to strengthen it in the future. Furthermore, the peers are of the opinion, that the specific focus of the three programmes could be better outlined by including more contemporary topics as elective courses. These could comprise internet security, architectures of networks (server client, peer-to-peer, virtual server concept, firewalls, cloud, etc.), OSI abstraction layers model, mobile networks types and standards, cryptography, big data, autonomous systems, self-x systems or simulation. Apart from these elective contents they agree that in all three programmes the fundamental aspect of analysis of systems could be strengthened while in the Networks Engineering programme the topic of graph theory is still underrepresented. On the other hand, the current course in engineering drawing might be reduced or removed into the electives field.

A further important point of discussion refers to the Graduation Project of the final semester. The peers are surprised by the sheer size of the module with 25 ECTS credits. At the same time, they realized during the inspection of those Graduation Project reports (equal to Bachelor theses) that they cannot be entirely compared in size nor scientific depth to the standards expected in the European Area of Higher Education. These works are usually limited to some 25 pages (although it has to be taken into account that the Chinese language is much shorter in written form than English) but also refer only to a limited amount of scientific literature. In most cases the peers found not more than ten literature references, the works being usually of a mere descriptive nature. Given the high amount of credits this surprised the peers. From the discussions on site, several reasons for this issue could be detected: First, the transfer from the contact-hour-based Chinese credit point system to ECTS credits usually works fine with courses and modules but not with the Graduation Project (see 2.2 for details). The real dimension of the project is much less than the number of credits suggests. Secondly, the practice-orientation of the programmes envisages to prepare students to take up a professional occupation as soon as possible. Only around 10% of the graduates continue their education on a related Master's level and those students would prepare Bachelor theses on a much more scientific level. For the majority of the students, the application of tools related to practical issues is the dominant aspect of the graduation project, not the academic analysis of problems. Finally, the students do not take classes on academic reading and writing before starting the Graduation Project. Although this may be part of some modules, no course is expressly dedicated to preparing the students for writing an academic paper or something comparable. They only receive individual instruction during the contact hours that are part of the Graduation Project.

In conclusion, the peers deem it necessary that the workload of the Graduation project should not be calculated along the contact hours but the individual student workload. This would reduce the credits to the international standards of about 10-15 ECTS credits and create free space for the introduction of courses on scientific research and writing before the students start with the Graduation Project. This would in the opinion of the peers contribute significantly to the improvement of the scientific level of the works.

Eventually, the peers do agree that the curricula are mostly adequate to achieve the intended learning outcomes of the programmes, although the special focus areas of the programmes could be more clearly reflected in the compulsory elements. Furthermore, aspects of project management should be included in each of the curricula to a certain degree and the Graduation Project should be revised insofar as to include more scientific analysis in contrast to project-oriented description.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- On-Site Discussions

Preliminary assessment and analysis of the peers:

The peers understand from the documentation and the discussions on site, that the admission to Bachelor's degree programmes in China is centrally regulated and organized by the government. Graduates of secondary schools take the National University Entrance Exams (Gaokao). Based on the results, students may choose from subjects at Universities distinguished in three categories (40 élite Universities in the highest level, 100 key provincial Universities – among those the USST – at second level and the rest in the third category of general Universities). Students apply with their results to those Universities eligible to them and the Universities follow their own admission procedure. If students are declined although they fulfil the basic entry requirements, Universities have to explain why they were not admitted at last. Since an admission reform in 2007 some Universities, among them the USST, have also obtained the privilege to admit a certain percentage of students outside the Gaokao process, solely based on internal assessment and admission regulations. The number of students thus admitted shall not exceed 20% of the total admissions. In conclusion, the peers agree that this process is nationally applied and transparent. Through the procedure, it is ensured that only highly qualified students are admitted to the respective programmes.

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

In their comments to the report, the programme coordinators outline in more specific details the learning objectives of the different programmes. From the documentation, the different special focus areas of the programmes become better understandable. Furthermore, the reflection of the focus areas in certain described core modules of the curricula facilitates the understanding. Consequently, the peers agree that the outstanding issue has been resolved but still point out that the precise learning outcomes must be transparently communicated to the students and documented in the Diploma Supplements for each programme.

Furthermore, the University has already initiated certain modifications concerning the graduation projects. The peers appreciate that their recommendations have been picked up insofar as a new course "Academic Reading and Writing" will be introduced in semester eight before the students begin to write the Bachelor thesis. The peers consent, that this

modification may lead to an improvement of the academic work and enhance the quality of the Bachelor theses. Nevertheless, they maintain their remarks concerning the actual student workload of the thesis project. Following the ECTS calculation of credits it would appear helpful to indicate how many hour of work all students were supposed to put into the final project, notwithstanding the number of contact hours they may have with their supervisor. This way it would be ensured that the results can be better compared with each other and equal standards of achieved quality could be maintained.

Concerning the aspects of project management the University further informs, that in the Intelligent System Engineering programme additional content with reference to project management will be added to an already existing course. It is outlined that in this programme the focus in on research, design and implementation of intelligent algorithms and systems and less on project management. Thus, this modification should be sufficient. The peers agree that this is an improvement and will at least ensure that project management will be present to a certain degree in all three curricula.

In Computer Engineering the University has also taken up some the peers' recommendations. Algorithm Design and Analysis will in future be mandatory course while Embedded Systems for Computer Engineering will be removed into the electives area. Similarly, in Network Engineering the coordinators will try to include a course on graph theory as suggested by the peers. With reference to the Engineering Drawing course it is explained that this is mandatory for all engineering students of the University and therefore it will hardly be possible to remove it from the mandatory courses. The peers see it very positively that their suggestions concerning ethical topics is also taken seriously. The coordinators outline that they plan to create a special Engineering Ethics course that will be offered as an online learning lecture. The peers agree that in a future re-accreditation the implementation of these plans should be verified.

Finally, the peers learn from the University's comments that it is planned to add several elective courses as a reaction to their report. Thus, in Computer Engineering and Network Engineering courses on mobile data management and bid data shall be added to the curriculum while a new elective course on autonomous systems and simulations systems shall be added to the Intelligent System Engineering programme.

In conclusion, the peers consider criterion to be fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report
- Appendix C: Curricula
- Appendix D: Module Handbooks
- Appendix E: Students Score Lists
- On-Site Discussions

Preliminary assessment and analysis of the peers:

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

Practical experience is of a particularly high relevance at USST Shanghai. All programmes are requested to include at least 25% of practice-related work within the curricula. In the case of the programmes under review this is especially achieved through a mandatory internship in the seventh semester valued at 25 credits as well as the Project Management module in two of the three programmes. A central University institution is supporting the finding of placements for internships; further, internship placements are being offered within the university in research centres. The students confirm that they have no difficulty at all in finding placements; a huge variety is also offered on a website and thus easily accessible. The university also supports students financially who want to be active in research projects or innovation projects. During the site visit, the University provided a list of eight subject-related research project where currently 35 excellent students are involved. These projects are primarily funded by the National Science Foundation China (NSFC) but also by the Ministry of Education as well as private companies. The organization of the internships is well regulated as was confirmed by all stakeholders. Students spend 14 weeks within a company and are being supervised by one academic and one industry supervisor. The students and teachers explained that the contact between students and academic supervisor during these internships is particularly close. Students can regularly communicate with their supervisor via WeChat but also meet at the company at regular intervals. One teacher could even report of a case where a student lost his internship and through the great support of the supervisor, a new placement could be found within 48 hours. This dedication was very much welcomed by the peers. At the end of the internship, students have to hand in a report about their work which is also presented orally at a general meeting.

Internationalization is also of growing importance for the USST and the respective programmes. However, since these are Bachelor programmes they are generally taught in Chinese with a few exceptions. However, all students have to take mandatory courses in English language and an increasing number of Master programmes are being offered completely in English. From the University management the peers learn that the city of Shanghai strongly supports the University's internationalization endeavours financially, especially since 2017. There are about 1000 international students at the whole University and 160 international partner Universities from over 30 countries, especially in Europe and the USA. Most international students so far come from neighbouring Asian countries and have previously learned Chinese. Non-Chinese students that spend only one semester at USST can choose from a variety of English-speaking courses from out of the whole university, not limited to the respective programmes. International outgoing mobility is still quite limited and not very popular among the students. The majority of students prefer to leave the country for a Master's degree somewhere else but during the Bachelor's programme the students are primarily focussed on completing the programme successfully in time. However, mobility is theoretically possible; some of the students confirmed that the option exists and is also financially supported by the University. However, scholarships are only awarded to excellent students. A procedure for the recognition of credits gained at other Universities is defined and in place. The peers understand that changes of Universities within China are very unusual but many students changes their degree programmes within the same University. This is easily possible and credits gained in other programmes are recognised if there are no significant differences.

Thus, the peers agree that the structure and modules of the programmes contribute to the achievement of the intended learning outcomes, a successful study process and the job opportunities of the students after graduation.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Report
- Appendix C: Curricula
- Appendix D: Module Handbooks
- On-Site Discussions

Preliminary assessment and analysis of the peers:
All modules in the degree programmes under review are credited according to the ECT System. Each semester comprises 30 ECTS credits, one credit being more or less equivalent to

30 working hours. The peers learn that the traditional Chinese credit system is not based on the workload but merely on the contact hours, with 16 theoretical contact hours or 32 practical training contact hours being equivalent to one Chinese credit. The transfer from Chinese to ECTS credits is so calculated that usually the Chinese credits have to multiplied by 1.5 to reach the ECTS credits. The peers understand the transfer and see that the module descriptions clearly outline the expected workload of students separated by contact hours and time for self-study. The only module where this transfer is not entirely functioning is the Graduation Project/Bachelor thesis. Here, the module description only outlines that it 14 weeks long with 14 contact hours, being multiplied by 1.5 the coordinators reached the square sum of 25 ECTS credits. However, this does not reflect the real workload expected of the students since it would imply that students work 750 hours on their thesis. This is neither practical nor is it reflected by the works reviewed by the peers. The timeframe of 14 weeks is quite common in other countries but the limit for Bachelor theses in countries of the European Area of Higher Education is set at 12 (sometimes 15) ECTS credits. This would imply a workload of maximum 450 hours. At the same time, this workload does not include the time spent with the supervisor or any additional instruction in academic research and writing. The peers would consider it very profitable of the Graduation project would be split thus split up into two or more courses, starting with a seminar on research and writing preparing the students for the upcoming individual research work. This would make the expected workload more transparent and contribute to the scientific value of the theses. The expected workload should also be clearly described in the module descriptions.

Concerning the review of student workload the peers understand that this is regularly surveyed as part of the course evaluations. If constant mismatches between expectation and reality appear the course contents will be adapted. In conclusion, it is apparent to the peers that the workload is generally suitable, courses are adequately credits and contribute to the study process.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Report
- Appendix B: 2013-2018 College student innovation project
- Appendix D: Module Handbooks
- Appendix F: Exam Regulations and Teaching Quality Assurance Process
- On-Site Discussions

Preliminary assessment and analysis of the peers:
From the presented material as well as the discussions on site, it becomes apparent that pedagogical skills and adequate teaching methodology are highly valued at USST and in the programmes under review. Evaluations of pedagogical skills and methods are frequently performed and workshops and trainings are offered to the teaching staff. The quality of teaching as assessed by the course evaluations is a precondition for internal promotion at USST. During the first stage of employment staff members receive three contracts for three years each, only afterwards they receive a permanent work contract. At the end of each three-year interval the research results but especially the teaching quality is being assessed when deciding about the new contract. All curricula are annually reviewed and student feedback concerning the teaching content as well as methodology is being taken into account when redesigning existing courses.

Most course material is provided to the students via an online platform where students can find additional material, presentations and also videos. Online learning is only developing in China where presence learning is still predominant. However, the peers learn from the staff members that USST is encouraging developments in the field of eLearning as well as blended learning. As a first step, one staff members informed the peers that on Master level a complete online course is currently being designed. This development appears to the peers as a very reasonable step. Although, traditionally students in China live on campus while attending University global trends such as further education or distance learning will most certainly also reach China and alternative teaching methods may contribute to dealing with these new circumstances.

According to the peers, the study programme concept comprises a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Report
- Appendix A: Student Competition Awards
- On-Site Discussions

Preliminary assessment and analysis of the peers:

The peers get a comprehensive impression of the offers related to support and assistance of the students at USST. The students confirm that an open-door policy is being practised and that the students can always approach all teaching and administrative staff. Each student is assigned an academic supervisor at the beginning of the degree programme; on average each member of the teaching staff supervises about five students. These supervisors are the first to be contacted by the students with any kind of problems, be it purely academic or even private. Similarly, the very personal supervision is organized during the internships and graduation projects when students and supervisors meet on a regular basis and discuss issues and progress. The peers were impressed by the fact that it is very common that students and teachers, especially supervisors, share private telephone numbers and communicate via WeChat whenever necessary. Apart from the personal supervision and academic support, the University offers a broad variety of support measures be it in the form of sports clubs, science clubs, research teams or internationalization. A very positive impression made the various international clubs housed in the historic buildings of the University on campus where each day intercultural activities are offered to all students interested and free of charge. This clearly made the impression of an open and active student environment, especially since the students are usually accommodated within the campus walls and have an easy access to learning, research and recreational facilities. In summary, the peers agree that the support and assistance measures in place at USST contribute to the successful completion of the study programmes under review.

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

The peers consider the criterion to be fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Appendix D: Module Handbooks
- Appendix F: Exam Regulations and Teaching Quality Assurance Process
- Appendix G: Official Documents about Learning Rules and Examination Regulations

- On-Site Discussions

Preliminary assessment and analysis of the peers:
All course content within the reviewed study programmes is examined. The examination type is defined in the module descriptions. Examination types are selected based on their competence orientation and may include written exams, presentations and project work. In each course the final grade represents a mixture of students participation during the classes, the mid-term exams as well as the final exam at the end of the semester. Failed exams can always be repeated once, if the second attempt is also failed the course has to be repeated. Theoretically, courses can be repeated as often as the students wish but additional repetitions have to be paid additionally since the student fees are based on the respective number of courses taken. The students approve the examination system and are generally content with the workload, although for the German peers the workload appears to be quite challenging. Two exams in one day are not infrequent but since the students confirm that this is usual within Chinese higher education and do not complain about it they do not over-emphasize this aspect.

During the on-site visit, the peers have reviewed a number of exams as well as Bachelor theses and detect that, apparently, the scientific level of the graduation project is not as elevated as might have been expected. Based on the structure of the works reviewed, the literature used and the amount of pages written, it appears to the review team that the graduation project is merely a description of a tool application instead of an analysis of an academic problem. From the teaching staff the peers learn that indeed the primary focus of the project is application-oriented and that scientific analysis is of rather minor importance. This has to be placed in the context of the general application-orientation of USST and the fact that only a limited number of students continues their studies on Master level. The majority is aiming at a professional position in industry immediately after graduation. The peers understand this general approach and do approve it but at the same time emphasize that the competence to analyse and solve academic problems individually must be a central objective of higher education. As has been outlined under criterion 1.3 they strongly recommend to review the graduation project module in terms of requirements and workload and to strengthen aspects of problem-solving and scientific writing. This could be achieved by way of an additional seminar preliminary to the graduation project where students can train the professional review of scientific literature, the writing of articles and are made better acquainted with scientific research standards.

Apart from this aspect, the peers consent that the programmes under review generally reflect the quality expected from University programmes on EQF Level 6. Consequently,

the peers agree that the examination system in place adequately supports the students' learning progress.

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

The peers consider the criterion to be fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Report
- Appendix H: Staff Awarding Sample List – Selected Papers
- Appendix I: Teachers Research Project List
- Appendix J: Teachers studying Abroad and in Enterprise
- On-Site Discussions

Preliminary assessment and analysis of the peers:

In the aftermath of the site visit the University provided a list of teaching staff within the programmes and their academic background. With this additional material and from the discussions on site the peers gained a clear impressions of the sufficient quantity as well as quality of the staff in order to convey the learning contents of the programmes under review. They were impressed by the regulation that all new staff members need to have completed a PhD degree. In Computer Engineering there are 21 full-time staff members, 75% of them with PhD, in Networks Engineering there are 16 full-time staff members, 87% holding a PhD degree and among the 20 Intelligent System Engineering staff even 90% hold a PhD. Apart from the academic background of the staff members, the University is also looking for teachers that have already obtained some professional experience in companies besides their academic career; thus, several staff members have previously worked with prominent companies such as Huawei and others. The peers appreciate this approach since it ensures that the staff members are in close contact with industry demand. The general teaching load of staff members is only five hours per week plus administrative tasks, lab supervision and student interaction. This leaves, in the eyes of the peer sufficient time for research activities and thus allows for a reasonable relation of teaching and research.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Appendix H: Staff Awarding Sample List – Selected Papers
- Appendix I: Teachers Research Project List
- Appendix J: Teachers studying Abroad and in Enterprise
- On-Site Discussions

Preliminary assessment and analysis of the peers:
The continuous development of the staff members in didactical as well as academic terms is of high priority at USST. The peers learn that during the first nine years, staff members receive three contracts for every three years. At the end of each interval, they are evaluated based on research activities, further didactical educations and student questionnaire results. The peers regard this system to be quite helpful in assuring that the teaching staff builds up strong competencies in the pedagogical field. Furthermore, the University generously supports these activities of the staff members, allowing for international mobility, participation in conference, publication of articles and language courses. In order to obtain a permanent position a staff members needs to have spent at least one year in abroad, a step that contributes to the University's internationalization ambitions.

In conclusion, the peers see that the University is providing a lot of support for professional development but encourage the University to enhance its support system of research activities on all levels of academic careers.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report
- Site Visit

Preliminary assessment and analysis of the peers:
During the on-site visit, the peers were able to gain a comprehensive impression of the facilities and laboratories at USST. Due to the combined support from national as well as regional government the University officials confirms that they can dispose of an excellent funding for the future development. This is underlined by the campus tour where the peers can see that the equipment with Computers and Software is absolutely adequate. Further-

more, high-tech equipment such as a Super-Computer are also available to student research teams. In summary, the peers consider the available equipment more than adequate for the performance of the programmes reviewed.

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

The peers consider the criterion to be fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Appendix D: Module Handbooks

Preliminary assessment and analysis of the peers:
The peers review the module descriptions for the programmes and see that they provide adequate information about the respective content, learning outcomes, examinations, workload distribution and grading. The students confirm during the discussions that information about the courses are always available online and that details concerning examinations and contents are provided at the beginning of each course by the teaching staff.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Appendix N: Diploma Samples
- Appendix O: Exemplary Diploma Supplement
- Appendix P: Transcript Samples

Preliminary assessment and analysis of the peers:
At graduation, each student is provided with a Diploma as well as a Diploma Supplement providing information about the programme, the curriculum, the individual grading, the average grading and the higher education system in China. However, the peers outline that so far the description of the programme learning outcomes is very general and not providing sufficient specific information about the special focus of each individual programme. Since the learning objectives should be formulated in a more detailed way this description is supposed to be inserted into the Diploma Supplements as well.

Criterion 5.3 Relevant rules

Evidence:

- Appendix F: Exam Regulations and Teaching Quality Assurance Process
- Appendix G: Official Documents about Learning Rule and Examination Regulations

Preliminary assessment and analysis of the peers:

From the documents provided and the discussions during the on-site visit, the peers learned that the USST follows a policy of transparent and open rules and regulations. All required rules and regulations are made accessible to students at any time online; full syllabi of the course contents are also provided to the students at the beginning of each course. The discussion with the students confirmed that they feel well informed about regulations and comfortable about the access to any information about their degree programmes.

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

As was outlined before, the peers consider the revised learning outcomes to be adequate. However, these shall be transparently communicated in the Diploma Supplement of each programme. Apart from this aspect the peers consider the criterion to be largely fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Appendix E: Students Score Lists
- Appendix F: Exam Regulations and Teaching Quality Assurance Process
- Appendix L: Teachers Evaluations
- Appendix M: Enrollment Statistics of the three Programmes (2014-2018)
- On-Site Discussions

Preliminary assessment and analysis of the peers:

At USST a thorough system of quality management has been introduced and is observed in order to ensure the ongoing process of development and programme improvement. All courses are reviewed annually based on this feedback mechanism and updated if input from the various participating stakeholders requires it. Feedback from industry partners as well as alumni is regularly requested as is confirmed by the industry partners. Before graduation also a general study programmes survey is answered by the students in order to gain an overview of positive and critical aspects of the programmes. At the centre of the feedback system are the course evaluations that are done online by the students for each course. However, usually the feedback is only given after the completion of the course and before the students choose their courses for the next semester. This prevents the teaching staff from giving an immediate feedback about the survey results to the students in the respective courses. The peers would prefer it if surveys could be done at an earlier stage of the semester so that the teachers can discuss the results afterwards with their students and outline to them in how far the survey will lead to any modifications in the future. This is the only step where the feedback loop is not entirely closed. Nevertheless, the peers learn that each semester the faculty holds one or two open meetings of students, teaching and administrative staff where issues and further developments are being discussed. This measure at least ensures that all students do have to opportunity to participate in the programme development and can receive information about future changes. Thus, in general the peers gain the impression that the Quality Assurance system at USST and within OECE faculty is well balanced and involves all relevant stakeholders.

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

The peers consider the criterion to be largely 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:

None.

E Comment of the Higher Education Institution (06.01.2020)

The institution provided a detailed statement to the report in a separate document.

F Summary: Peer recommendations (09.01.2020)

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Computer Engineering	With requirements for one year	Euro-Inf®	30.09.2025
Ba Network Engineering	With requirements for one year	Euro-Inf®	30.09.2025
Ba Intelligent System Engineering	With requirements for one year	Euro-Inf®	30.09.2025

Requirements

For all programmes

A 1. (ASIIN 5.2) The respective learning outcomes must be outlined in the Diploma Supplement.

Recommendations

For all programmes

E 1. (ASIIN 1.3) It is recommended to review the curricula to ensure that the specific focus of each programme is adequately reflected in the mandatory parts of the curriculum and not just in the electives.

E 2. (ASIIN 1.3 / 2.2.) It is recommended to improve the reflection of the actual students' workload in the graduation project in the number of awarded credits.

E 3. (ASIIN 1.3) It is recommended to strengthen the aspect of ethics in Computer Science.

E 4. (ASIIN 6) It is recommended to better close the feedback loops by ensuring that students are informed about the results of their evaluations in the respective courses.

G Comment of the Technical Committee 04- Informatics (09.03.2020)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the accreditation procedure. It follows the decision of the peers without making any changes.

Assessment and analysis for the award of the Euro-Inf® Label:

The Technical Committee deems that the intended learning outcomes of the degree programme do comply with the Subject-Specific Criteria of the Technical Committee 04 - Informatics.

The TC 04 – Informatics recommends the award of the seals as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditaiton**
Ba Computer Engineering	With requirements for one year	Euro-Inf®	30.09.2025
Ba Network Engineering	With requirements for one year	Euro-Inf®	30.09.2025
Ba Intelligent System Engineering	With requirements for one year	Euro-Inf®	30.09.2025

H Decision of the Accreditation Commission (20.03.2020)

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

The Accreditation Committee discusses the procedure and fully agrees with the assessment of the peers and the Technical Committee.

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Computer Engineering	With requirements for one year	Euro-Inf®	30.09.2025
Ba Network Engineering	With requirements for one year	Euro-Inf®	30.09.2025
Ba Intelligent System Engineering	With requirements for one year	Euro-Inf®	30.09.2025

Requirements

For all programmes

A 1. (ASIIN 5.2) The respective learning outcomes must be outlined in the Diploma Supplement.

Recommendations

For all programmes

E 1. (ASIIN 1.3) It is recommended to review the curricula to ensure that the specific focus of each programme is adequately reflected in the mandatory parts of the curriculum and not just in the electives.

E 2. (ASIIN 1.3 / 2.2.) It is recommended to improve the reflection of the actual students' workload in the graduation project in the number of awarded credits.

E 3. (ASIIN 1.3) It is recommended to strengthen the aspect of ethics in Computer Science.

E 4. (ASIIN 6) It is recommended to better close the feedback loops by ensuring that students are informed about the results of their evaluations in the respective courses.

Appendix: Programme Learning Outcomes and Curricula

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

1) Basic scientific literacy and engineering capabilities

- Understand mathematics and natural science, and apply these abilities to solve practical problems;
- For general computer-based application system, have the ability to understand and participate in the job and skill requirement;
- Understand the development trend and application prospect of computer science and technology.

2) Professional competences and capabilities

- The ability to master and use professional knowledge;
- Have strong professional practice skills and ability after employment;
- Be able to pursue further education, engage in scientific research and prepare for postgraduate study.

3) Engineering thinking and practice ability

- Have thinking ability to apply the knowledge of computer theory to solve practical problems in engineering;
- Have basic knowledge and skills to solve engineering problems;
- Have ability to analyze, design, implement and operate computer engineering projects.

4) Capability in international communication

- Be able to access professional materials in English;
- Be able to communicate with foreign counterparts and study abroad;
- Be able to work and collaborate in multinational companies with knowledge of English and foreign cultural backgrounds.

5) Team-work and management capabilities

- Have good communication skills and team work spirit;
- Have healthy psychological and complete personality;
- Have good legal awareness and sense of social responsibility.

6) The consciousness and ability of lifelong learning

- Be able to learn new professional knowledge continuously;

- Be able to learn engineering practice skills;
- Be aware of lifelong learning of computer theory and technology.

The following **curriculum** is presented:

Curriculum of Computer Engineering

Competence Fields	Module Code	Module Nmae	Type	CP	Hours	S1	S2	S3	S4	S5	S6	S7	S8
						CP	CP	CP	CP	CP	CP	CP	CP
Fundamental Theory 36 CPs (15.0%)	22000210	Higher Mathematics I	L	8	96	8							
	22000220	Higher Mathematics II	L	8	96		8						
	22000622	Linear Algebra	L	3	32	3							
	22000172	Probability Theory and Mathematical Statistics	L	4	48			4					
	12002040	Discrete Mathematics	L	4	48			4					
	22000071	College Physics	L&P	6	80		6						
	14000322	Engineering Drawing	L&P	3	32	3							
Professional Foundation	12003010	Introduction to Computer Engineering	L	2	16	2							
	12002000	C Programming and Practice	L&P	4	48	4							

44 CPs (18.3%)	12002510	Object Oriented Programming	L&P	6	80		6						
	12002900	Operating System	L&P	6	80			6					
	12002910	JAVA Programming	L&P	6	80			6					
	12002070	Digital Circuits	L&P	5	64				5				
	12002920	Data Structures	L&P	5	64				5				
	12002950	Computer Organization	L&P	5	64				5				
	12001780	Computer Networks	L&P	5	64				5				
Engineering Capabilities 50 CPs (20.8%)	12002240	Software Engineering	L&P	5	64					5			
	12002230	Database Principles	L&P	5	64					5			
	12003550	Web Application Development	L&P	5	64					15			
	12003560	Multimedia Applications	L&P	5	64								
	12003580	Software Project Process Management	L&P	5	64								
	12003450	Artificial Intelligence	L&P	5	64								

	12003610	Algorithm Design and Analysis	L&P	5	64									
	12003270	Digital image Processing	L&P	5	64									
	12003540	Team Software Project Development	L&P	5	64						5			
	12003190	Embedded Systems	L&P	5	64						5			
	12003570	Distributed Computing	L&P	5	64									
	12002260	Interface and Communication	L&P	5	64									
	12003590	Software Testing	L&P	5	64									
	12003600	Compiler Principles	L&P	5	64						15			
	12003620	Mobile Application Development	L&P	5	64									
	12003370	Information Security	L&P	5	64									
English Language 12 CPs (5.0%)	1500XXXX	College English I	L&P	3	48	3								
	1500XXXX	College English II	L&P	3	48		3							
	1500XXXX	College English III	L&P	3	48			3						

	1500XXXX	College English IV	L&P	3	48				3				
Soft Skill 30 CPs (12.5%)	32000010	Morality and Law	L	3	48	3							
	32000020	Chinese History	L	3	48		3						
	32000030	Principle of Marxism	L	3	48			3					
	32000120	Socialist Theory	L	3	48				3				
	41000010	Military Knowledge and Military Training	L&P	3	48	3							
	3110XXXX	Physical Education I	P	1	32	1							
	3110XXXX	Physical Education II	P	1	32		1						
	3110XXXX	Physical Education III	P	1	32			1					
	3110XXXX	Physical Education IV	P	1	32				1				
		Economic Management	L	2	32					2			
		Humanities and Social Sciences	L	2	32						2		
		Music and Art Education	L	2	32							2	

		Chinese Language and Culture	L	2	32								2
		Elective		3									3
Engineering Pratice 68 CPs (28.3%)	12101470	Electronic Practice	P	3	2W		3						
	12100710	Project of C Programming	P	3	2W			3					
	12101030	Project of Data Structures	P	3	2W				3				
	12102180	Project of Computer Engineering	P	3	2W						3		
		Project of Entrepreneurship and Inovation I	P	3	2W					3			
		Project of Entrepreneurship and Inovation II	P	3	2W							3	
	12100560	Internship	P	25	16W							25	
	12101060	Graduation Project	P	25	16W								25
CP SUM = 240		**CP PER SEMESTER**				**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**

(Note: CP-Credit Point, S-Semester, L-Lecture, P-Practice, W-Week)

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

1) Basic scientific literacy and engineering capabilities

- Understand mathematics and natural science, and apply the ability to solve practical problems;
- For general network-based application system, have the ability to understand and participate in the needs of the job and technology;
- Understand the development trend and application prospect of modern network science and technology.

2) Professional competences and capabilities

- The ability to master and use professional knowledge;
- Have strong professional practice skills and ability after employment;
- Be able to pursue further education, engage in scientific research and prepare for postgraduate study.

3) Engineering thinking and practice ability

- Have thinking ability to apply the knowledge of network theory to solve practical problems in engineering;
- Have basic knowledge and skills to solve engineering problems;
- Have ability to analyze, design, implement and operate network engineering projects.

4) Capability in international communication

- Be able to access professional materials in English;
- Be able to communicate with foreign counterparts and study abroad;
- Be able to work and collaborate in multinational companies with knowledge of English and foreign cultural backgrounds.

5) Team-work and management capabilities

- Have good communication skills and team work spirit;
- Have healthy psychological and complete personality;
- Have good legal awareness and sense of social responsibility.

6) The consciousness and ability of lifelong learning

- Be able to learn new professional knowledge continuously;
- Be able to learn engineering practice skills;
- Be aware of lifelong learning of network theory and technology.

The following **curriculum** is presented:

Competence Fields	Module Code	Module Name	Type	CP	Hours	S1 CP	S2 CP	S3 CP	S4 CP	S5 CP	S6 CP	S7 CP	S8 CP
Fundamental Theory 36 CPs (15.0%)	22000210	Calculus I	L	8	96	8							
	22000220	Calculus II	L	8	96		8						
	22000622	Linear Algebra	L	3	32	3							
	22000172	Probability Theory and Mathematical Statistics	L	4	48			4					
	12002040	Discrete Mathematics	L	4	48			4					
	22000071	College Physics	L&P	6	80		6						
	14000322	Engineering Drawing	L&P	3	32	3							
Professional Foundation 44 CPs (18.3%)	12003020	Introduction to Network Engineering	L	2	16	2							
	12002000	C Programming and Practice	L&P	4	48	4							
	12002510	Object Oriented Programming	L&P	6	80		6						
	12002900	Operating System	L&P	6	80			6					
	12002910	JAVA Programming	L&P	6	80			6					
	12002070	Digital Circuits	L&P	5	64				5				
	12002920	Data Structures	L&P	5	64				5				
	12002950	Computer Organization	L&P	5	64				5				
	12001780	Computer Networks	L&P	5	64				5				
Engineering Capabilities 50 CPs (20.8%)	12003630	Routing and Switching	L&P	5	64					5			
	12003640	Internet Protocol Analysis	L&P	5	64					5			
	12003660	WSN and IoT	L&P	5	64								
	12003550	Web Application Development	L&P	5	64								
	12003680	Wireless Communication Networks	L&P	5	64					15			
	12003690	Network Programming	L&P	5	64								
	12003220	Communication Principles	L&P	5	64								
	12002230	Database Principles	L&P	5	64								
	12001890	Network Engineering	L&P	5	64						5		
	12003650	Network Security	L&P	5	64						5		
	12003670	Network Management	L&P	5	64								
	12003190	Embedded Systems	L&P	5	64								
	12003700	Network Analysis and Testing	L&P	5	64						15		
	12003710	LINUX Operating System	L&P	5	64								
	12003720	Access Network	L&P	5	64								
	12003730	Software Project Management	L&P	5	64								
English Language 12 CPs (5.0%)	1500XXXX	College English I	L&P	3	48	3							
	1500XXXX	College English II	L&P	3	48		3						
	1500XXXX	College English III	L&P	3	48			3					
	1500XXXX	College English IV	L&P	3	48				3				
Soft Skill 30 CPs (12.5%)	32000010	Morality and Law	L	3	48	3							
	32000020	Chinese History	L	3	48		3						
	32000030	Principle of Marxism	L	3	48			3					
	32000120	Socialist Theory	L	3	48				3				
	41000010	Military Knowledge and Military Training	L&P	3	48	3							
	3110XXXX	Physical Education I	P	1	32	1							
	3110XXXX	Physical Education II	P	1	32		1						
	3110XXXX	Physical Education III	P	1	32			1					
	3110XXXX	Physical Education IV	P	1	32				1				
		Economic Management	L	2	32					2			
		Humanities and Social Sciences	L	2	32						2		
		Music and Art Education	L	2	32							2	
		Chinese Language and Culture	L	2	32								2
		Elective		3									3
Engineering Practice 68 CPs (28.3%)	12101470	Electronic Practice	P	3	2W		3						
	12100710	Project of C Programming	P	3	2W			3					
	12101030	Project of Data Structures	P	3	2W				3				
	12102310	Project of Network Engineering	P	3	2W						3		
		Project of Entrepreneurship and Innovation I	P	3	2W					3			
		Project of Entrepreneurship and Innovation II	P	3	2W							3	
	12100560	Internship	P	25	16W							25	
	12101060	Graduation Project	P	25	16W								25
CP SUM = 240		CP PER SEMESTER				30	30	30	30	30	30	30	30

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme Intelligent System Engineering:

1) Basic scientific literacy and engineering capabilities

- Understanding of mathematics and natural sciences and the ability to solve practical problems;
- For general intelligent application systems, they have the ability to understand and participate in the post and technical requirements.
- Understanding the development trend and application prospect of modern intelligence science and technology.

2) Professional competences and capabilities

- The ability to master and apply professional knowledge;
- Having strong professional practical skills and abilities after graduating;
- Ability to pursue advanced studies, engage in scientific research and pursue postgraduate studies.

3) Engineering thinking and practice ability

- Applying artificial intelligence and other theoretical knowledge to the thinking ability of solving practical engineering problems;
- Have basic knowledge and skills to solve engineering problems;
- Ability to analyze, design, implement and operate intelligent system engineering projects.

4) Capability in international communication

- Ability to consult English professional materials;
- Ability to communicate with foreign counterparts and study abroad;
- Knowledge of English and foreign cultural background, ability to work and collaborate in multinational corporations.

5) Team-work and management capabilities

- Good communication skills and teamwork spirit;
- Having healthy mind and complete personality;
- Having a good sense of law and social responsibility.

6) The consciousness and ability of lifelong learning

- Ability to constantly learn new professional knowledge;
- Ability to learn engineering practice skills;
- Consciousness and learning ability of lifelong learning of intelligent theory and technology.

The following **curriculum** is presented:

Competence Fields	Module Code	Module Name	Type	CP	Hours	S1 CP	S2 CP	S3 CP	S4 CP	S5 CP	S6 CP	S7 CP	S8 CP
Fundamental Theory 36 CPs (15.0%)	22000210	Calculus I	L	8	96	8							
	22000220	Calculus II	L	8	96		8						
	22000622	Linear Algebra	L	3	32	3							
	22000172	Probability Theory and Mathematical Statistics	L	4	48			4					
	12002040	Discrete Mathematics	L	4	48			4					
	22000071	College Physics	L&P	6	80		6						
	14000322	Engineering Drawing	L&P	3	32	3							
Professional Foundation 44 CPs (18.3%)	12003000	Introduction to Intelligent Engineering	L	2	16	2							
	12002000	C Programming and Practice	L&P	4	48	4							
	12002510	Object Oriented Programming	L&P	6	80		6						
	12002900	Operating System	L&P	6	80			6					
	12002910	JAVA Programming	L&P	6	80			6					
	12002070	Digital Circuits	L&P	5	64				5				
	12002920	Data Structures	L&P	5	64				5				
	12002940	Microcontroller Principles	L&P	5	64				5				
	12000862	Automatic Control Principle	L&P	5	64				5				
Engineering Capabilities 50 CPs (20.8%)	12003450	Artificial Intelligence	L&P	5	64					5			
	12000600	Digital Signal Processing	L&P	5	64					5			
	12002230	Database Principles	L&P	5	64					15			
	12003470	Computer Simulation	L&P	5	64								
	12003490	Data Mining	L&P	5	64								
	12003190	Embedded Systems	L&P	5	64								
	12003520	Information Theory and Coding	L&P	5	64								
	12003140	Modern Control Theory	L&P	5	64								
	12001450	Intelligent Information Handling	L&P	5	64						5		
	12003460	Machine Vision	L&P	5	64						5		
	12003480	Pattern Recognition	L&P	5	64						15		
	12001430	Intelligent Detection	L&P	5	64								
	12003500	Autonomous Mobile Robots	L&P	5	64								
	12003510	Networks and Communication	L&P	5	64								
	12001480	Natural Language Understanding	L&P	5	64								
	12003530	Intelligent Control	L&P	5	64								
English Language 12 CPs (5.0%)	1500XXXX	College English I	L&P	3	48	3							
	1500XXXX	College English II	L&P	3	48		3						
	1500XXXX	College English III	L&P	3	48			3					
	1500XXXX	College English IV	L&P	3	48				3				
Soft Skill 30 CPs (12.5%)	32000010	Morality and Law	L	3	48	3							
	32000020	Chinese History	L	3	48		3						
	32000030	Principle of Marxism	L	3	48			3					
	32000120	Socialist Theory	L	3	48				3				
	41000010	Military Knowledge and Military Training	L&P	3	48	3							
	3110XXXX	Physical Education I	P	1	32	1							
	3110XXXX	Physical Education II	P	1	32		1						
	3110XXXX	Physical Education III	P	1	32			1					
	3110XXXX	Physical Education IV	P	1	32				1				
		Economic Management	L	2	32					2			
		Humanities and Social Sciences	L	2	32						2		
		Music and Art Education	L	2	32							2	
		Chinese Language and Culture	L	2	32								2
		Elective		3									3
Engineering Practice 68 CPs (28.3%)	12101470	Electronic Practice	P	3	2W		3						
	12100710	Project of C Programming	P	3	2W			3					
	12100690	Project of Microcontroller Principles	P	3	2W				3				
	12102060	Project of Intelligent System Engineering	P	3	2W						3		
		Project of Entrepreneurship and Innovation I	P	3	2W					3			
		Project of Entrepreneurship and Innovation II	P	3	2W							3	
	12100560	Internship	P	25	16W							25	
	12101060	Graduation Project	P	25	16W								25
CP SUM = 240		CP PER SEMESTER				30	30	30	30	30	30	30	30