ASIIN Seal & Euro-Inf®

Accreditation Report

Bachelor's Degree Programme
Computer Science
Computer Engineering

Provided by
University of Hail
Male Campus

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]
بكالوريوس فى علوم الحاسب	Bachelor of Science in Computer Science	ASIIN	International Accreditation from ASIC (Valid till 2022) QMS accreditation (Valid till 2023)	04
بكالوريوس فى هندسة الحاسب	Bachelor of Science in Computer Engineering	ASIIN	International Accreditation from ASIC (Valid till 2022) QMS accreditation (Valid till 2023)	04
Date of the contract: 13.02.2018 **Submission of the final version of the self-assessment report:** 28.03.2018 **Date of the onsite visit:** 06.-08.11.2018				

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[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).

at: Hail, Saudi Arabia	
Peer panel: Prof. Dr. Heinz-Peter Gumm, University of Marburg; Prof. Dr. Ulrich Bühler, University of Applied Sciences Fulda; Jürgen Schaldach, T-Systems GEI GmbH	
Representative of the ASIIN headquarter: Dr. Martin Foerster	
Responsible decision-making committee: Accreditation Commission for Degree Programmes	
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 Science	B.Sc.		6	Full time	-	8 Semester	220 ECTS/ 132 CH. (KSA)	September, 2005
Computer Engineering	B.Sc.		6	Full time	-	8 Semester	220 ECTS/ 132 CH. (KSA)	September, 2005

For the <u>Bachelor's degree programme Computer Science</u> the institution has presented the following profile in the self-assessment report:

„Objectives and Learning Outcomes of Computer Science Program

The educational objectives of the degree program in Computer Science are consistent with the university and College mission. University of Hail vision is to achieve the leadership and excellence in education, research studies, and community service in order to build the society and the knowledge-based economy.

The University of Hail mission is consolidating standard education and research that aims to develop and provide better service to the community. These services will be in an effective teaching and learning environment, build a distinguish partnership with community and make optimal utilization of available resources, using the sophisticated technology and strategy to achieve these goals.

The College of Computer Science and Engineering strives for excellence in education and learning fields, scientific research, and social services in Computer Science, Software Engineering, and Computer Engineering regionally and nationally.

The College of Computer Science and Engineering is committed to graduate distinguished students to fulfill labor market needs and local community through providing educational

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

environment attracting qualified personnel and utilizing the best technology aligned with Saudi society values.

Computer Science Program Vision

An excellent academic performance in the domain of Computer Science area at both local and regional level.

Computer Science Program Mission

Preparing highly qualified Computer Science professionals competent to contribute both the local and regional competition through a commitment to maintaining the standard of quality and excellence in education, scientific research, and community services."

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

„Objectives and Learning Outcomes of Computer Engineering Program

The educational objectives of the degree program in Computer Engineering are consistent with the university and college mission. University of Hail vision is to achieve the leadership and excellence in education, research studies, and community service, in order to build the society and the knowledge-based economy.

The University of Hail mission is consolidating standard education and research that aims to develop and provide better service to the community. These services will be in an effective teaching and learning environment, build a distinguish partnership with community and make optimal utilization of available resources, using the sophisticated technology and strategy to achieve these goals.

The faculty of Computer Science and Engineering strives for excellence in education and learning fields, scientific research, and social services in Computer Science, Software Engineering, and Computer Engineering regionally and nationally.

The faculty of Computer Science and Engineering is committed to graduate distinguished students to fulfill labor market needs and local community through providing educational environment attracting qualified personnel and utilizing the best technology aligned with Saudi society values.

Computer Engineering Program Vision

To excel in teaching, learning, scientific research, and community services in the field of computer engineering, regionally.

Computer Engineering Program Mission

The Computer Engineering program transforms the next generation of engineers for future challenges, conducts research, and disseminates knowledge through different platforms for the benefits of the society."

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
- On-site discussions

Preliminary assessment and analysis of the peers:

For both study programmes, the HEI presented a detailed description of general learning outcomes in the self-assessment report (SAR). The peers approve that for each programme a detailed presentation of learning outcomes is given in the SAR in combination with learning outcome matrices matching the described learning outcomes with the respective modules of the programmes.

In the Computer Science programme it is envisaged that graduates shall be able to design, develop, document, and test software using current techniques as well as to understand the fundamentals of computer architecture and computing theory. The students will among other aspects gain knowledge of the fundamental hardware components and their functionality and learn programming languages, software systems and their objectives. They should have the competence to design systems by applying efficient methodologies, analyse problems and their solution using different tools and measurements and apply the concepts of science and mathematics in problem-solving.

All students should be capable to solve problems individually and to present their research results in oral as well as written form. They should be able to work in teams, cooperate with partners from different professional backgrounds and develop leadership skills in computer projects. Furthermore, it is emphasized that the students should be made aware of

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[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.

the importance of social and ethical issues related to the profession. Once the degree programme is completed, the graduates will be ready to continue their studies and develop their research skills in the form of a Master programme or to work in the broad professional field of Computer Science.

In the Computer Engineering programme it is targeted that the students gain the basic knowledge as well as the skills of the major fundamentals of hardware and software components appropriate for Computer Engineering systems. Graduates shall possess solid background in mathematics, algorithms, and hands-on networking systems and be able to identify, formulate and analyse complex Computer Engineering problems to reach substantiated conclusions along with recommendations using principles of mathematics, natural science, and engineering science. The students will gain the competence to recognize the features and differences between main computer architecture families, to apply different techniques to understand and use software components and programming structures and to design large-scale digital systems with different options and alternatives.

In addition, all graduates shall be capable to work effectively in teams, communicate their research results in oral and written form as well as possess an awareness of the social and ethical implications of their actions. After a successful conclusion of their studies, students will be able to continue their education in a Master programme or to work professionally in the field of Computer Engineering.

In conclusion, the peers agree that both programmes adequately reflect the ASIIN Subject-Specific Criteria as well as the EQF-level 6 for Bachelor programmes.

Criterion 1.2 Name of the degree programme

Evidence:
- Self-Assessment Report

Preliminary assessment and analysis of the peers:
The panel considered the names of the study programmes to be adequately reflecting the respective aims, learning outcomes and curricula.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- On-Site discussions

Preliminary assessment and analysis of the peers:

The curricula of all study programmes under consideration were reviewed by the panel in order to identify whether the described learning objectives can be achieved by the available modules. Course descriptions as well as matrices matching the general learning objectives and the module contents were also presented for a detailed analysis. Furthermore, the discussions during the on-site visit revealed that the current curricula are in a constant revision process and that several modifications have already been applied for with the HEI management, as will be outlined in more detail below. It has to be pointed out, that the peers generally assessed the current status of the programmes but that they took notice of the planned developments and consider them a great improvement in the direction which they themselves indicate in their recommendations. However, as the curricula development process was not officially concluded at University level the programmes will be described as they were at the moment of the on-site visit.

In both programmes, students have to take a preparatory year before the beginning of the Freshman Year of their Bachelor's programme. In these two semesters, students are generally prepared for academic life and learn the basics of Math and English. Only afterwards do the real academic programmes start. The peers are not considering the additional, non-subject-related curses on Islamic Religion, economy and physical education.

In the Computer Science programme, the first study year (Freshman year) is reserved for general introductions and basic knowledge in the natural sciences with courses in Chemistry, Physics and Computer Programming but also several English courses, religious education and sports. The second year (Sophomore) offers almost exclusively core Computer Science and Math courses such as Data Structure, Discrete Structures and several mathematical courses. This structure is basically kept up in the third (Junior) year with modules on Computer Architecture, Programming, Computer Networking Systems, etc. In the last semester of their Junior year and more so in the Senior year students are offered a choice of electives. They also are required to take a course in Objective Writing in order to improve the scientific writing skills. The seventh semester is reserved for the COOP Education, an internship where students are being prepared for later professional options before they return in the final semester to conclude the programme with several electives and a senior project.

In Computer Engineering, students similarly start the degree programme in their Freshman year with introductory courses on Chemistry, Physics, Computer Programming but also

English, Religion and Sports. In their Sophomore year, fundamental skills in the discipline are being conveyed (Fundamentals of Computer Engineering, Electric Circuits, Electronics, etc.). In the third year, a further specialization is carried out with two elective courses and modules on Microcomputer System Design, Data & Computer Communication or Principles of VLSI Design. Additionally, students have to take courses on Religion but also scientific research (Technical Report Writing and a seminar). As in the Computer Science programme, the seventh semester is reserved for the COOP Education before students take the final semester with two more electives, a System Design Lab and a module on Operating Systems.

While the peers already agreed that the curricula as described above were generally compliant with international standards, it was also discussed if not some aspects such as IT Security or Theoretical Computer Science could be strengthened in place of some other contents. The peers understood that plans for curriculum change in that regard are already being discussed. Following the wishes of the programme coordinator of Computer Science, a compulsory module in IT Security and Computer Theory will be introduced soon. At the same time the College is working on the introduction of several Master programmes among which a Master in IT Security will figure prominently. The peers considered these plans to be exactly what they were expecting and expressed their support for the coordinators in pursuing them. Furthermore, it was controversially discussed if more programming languages should be introduced as compulsory. Currently, the curriculum focusses on Java as the predominant programming language but alternatives are also touched upon in certain elective courses. The peers were very much impressed by the fact that students themselves offer additional voluntary courses, for example on Python, in their free time, which further broadens the students' opportunities. While such offers are very helpful, the programme coordinators are encouraged to think about the full implementation of at least a second programming language in the future development of the curricula.

The second major issue detected by the peers was the lacking of a final or capstone project equivalent to a Bachelor thesis. According to the ASIIN criteria and the opinion of the peers, each student should document his ability to work independently for some time on a research project, analyse scientific literature and present the results of this work in written form. At the moment, the Computer Science programme does include a Senior Project in the final semester but this is very small with a size of about 5 ECTS credits while the Computer Engineering programme does not have any final project at all. The programme coordinators agreed with the peers' assessment that the extension or creation of such a module was necessary and explained that in the development of the programmes this would be the next step envisaged. As Bachelor theses and scientific research do not have such a large tradition in Saudi education, it was considered necessary to introduce it step by step. In the

next curricula already in the approval process, final projects are going to be compulsory in both programmes, and in Computer Science the project will be extended to two semesters. This way, more credits can be assigned to it, and the scientific level shall be improved. The peers approve of these measures and agree that with the implementation of these reforms the demand for a capstone project could be met.

In conclusion, the peers agree that the curricula are up to date and adequate in order to reach the described learning outcomes of the programmes. Once the described curricular modifications will be implemented, the programmes will also comply in all aspects with the ASIIN criteria.

Criterion 1.4 Admission requirements

Evidence:
- Self-Assessment Report
- On-Site discussions

Preliminary assessment and analysis of the peers:
Admission regulations are based on national legislation as well as University rules. For admission to the University of Hail, applicants need to have a High School certificate and pass the respective entrance exams. Accepted students have to pass the preparatory year with a special focus on English, Mathematics, Computer Skills and non-technical subjects. After successfully completing the preparatory year, the students will be accepted in the Computer Science program if their GPA is better than 1.75 out of 4 and in the Computer Engineering programme if their GPA is better than 2 out of 4. The peers agree that the admission policy is generally transparent and acceptable.

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

The peers conclude that the criterion is partly fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report

- On-Site discussions

Preliminary assessment and analysis of the peers:

All study programmes under review are divided into modules, which comprise a sum of teaching and learning. In general, the panel found the structure of the modules to be adequate and manageable. The modules are split into four different categories (compulsory college and university requirements, compulsory general, free electives and general electives). All modules are divided into lecture and lab units as well as time for self-study and exam preparation. In most modules, practical work is included while the students gain additional professional practice during the compulsory COOP Education in the seventh semester. The peers consider it laudable that so much professional training is included in order to give the students the best opportunities to establish contact with possible employers already during the final stage of their studies. The discussion with industry representatives revealed that many companies receive COOP students on a regular basis and that a growing number of companies is settling down in the Hail area. This is especially important as the young university understands itself as a Higher Education Institutional for the region and most students are coming from the local area. In order to provide them with job opportunities at home, the peers emphasized that the cooperation with companies in the province has to be maintained on the high level already achieved.

In each programme, the students can choose between different electives during the course of their studies. This allows for a certain specialization and will be of growing importance once the respective Master programmes will be introduced. The selection of electives and the composition of the individual study plans in general is done individually by the students in cooperation with their personal supervisor every semester. The peers were pleased to learn that each of the listed electives will indeed be offered once every year.

Concerning the aspect of internationalization, the peers noticed that this is still an aspect under development. However, they did understand that international mobility on Bachelor level is not the highest priority of the university at this stage, rather to take roots in the region and to provide education and jobs for the local population. Nevertheless, the programme coordinators envisage international partnerships and the international staff provides a number of possible contacts throughout the world. From the discussion with the students, the peers also learned that students would like to spend some time abroad, for example during their COOP Education. Apparently, this is theoretically possible and the peers thought this to be a good idea as many of the companies in Saudi Arabia are acting on an international level. Maybe it would be possible to award international internships to

outstanding students as long as international mobility to other universities is still difficult. In any case, the peers clearly saw that mobility is of importance when it comes to the Master level. As there are no Master programmes for many subjects but the university requires a growing number of skilled staff, scholarships are awarded to Bachelor graduates whose GPA exceeds a certain limit, to join Master programmes at other universities within or outside the Kingdom. Once they have completed their degrees, they are required to return and teach at Hail University for a given period of time. The peers saw this practice in a very positive light as it allows for (international) mobility and at the same time assures the continuous backflow of innovation and talent.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Report

- Module descriptions

- On-Site discussions

Preliminary assessment and analysis of the peers:
As was outlined above, all modules are assigned with credit hours between 1 and 4 credits per course amounting to 15 to 19 credits each semester. Consequently, the credits are more or less equally distributed over eight semesters with the exception of the seventh semester with the COOP Education. This semester is valued at only 9 credits. Saudi credit hours do not count the actual workload of the students but only estimate the time spent in classes, in laboratories and during self-study. However, the excellent module descriptions presented to the peers clearly indicated for each course the expected workload in time hours for every week. Thus, a transfer of the workload into the ECT System was easily possible and revealed that the workload is evenly distributed and usually meets the reality. The students confirmed that the calculation of the workload was transparent to them and that the time indicated in the module descriptions was sufficient. Hence, there had not yet been any reason to complain about the amount of workload.

The only problem outlined by the peers referred to the COOP Education. Currently, the students have to spend at least four months in internships handing in written reports every month documenting their work and progress. Although, according to the new development plan, the COOP Education will be reduced to three months in order to create more space for the final project, the peers outline that nine credits in this case do not reflect the real

student workload nor the expectancy of time invested. In this case, not even the module descriptions offers more information about the actual workload. This is generally understandable, because the Saudi credit system only refers to contact hours and during an internship the number of class hours is limited. Consequently, the peers think it important to outline in the description how much time each student has to spend with one company and how many hours of working are reflected in the number of 9 contact hours in this particular case. This is crucial as the practical experience is of major importance for future employers and therefore, graduates form Hail University will be able to document clearly how much time they already spent in industry when applying for jobs.

Criterion 2.3 Teaching methodology

Evidence:
- Self-Assessment Report
- On-site-discussions

Preliminary assessment and analysis of the peers:
It has already been outlined that teaching in both programmes includes theoretical foundations as well as practical work, which was welcomed by the peers. In general, teaching includes lectures, classroom exercises, tutorials, group exercises, laboratory work, as well as group work and individual projects. As mentioned before, the peers were also very impressed by the active participation of outstanding students as tutors and voluntary teachers. Thus, the teaching methodology does not only include a top-down approach from professor to student but also student for student teaching in subjects that are not offered in the curriculum as well as supplementary courses in difficult matters where students would require additional support. In conclusion, the peers clearly saw that the teaching methods applied in the degree programmes are diverse, up-to-date and oriented towards the best learning approach of the students.

Criterion 2.4 Support and assistance

Evidence:
- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:

The peers had an excellent impression of the offers related to support and assistance for the students at the College. The students confirmed that the teaching staff is always available to any questions and supports the students in every possible way. In addition, student representatives participate in the quality assurance committees and consequently feel well taken care of. A special support to students is given through the intense, individual tutoring of each student. At the beginning of each semester student and tutor meet to agree on the study plan and discuss specializations and electives as well as bad GPA performance or other challenges. The study plans have to be signed officially by the tutor in order to ensure that each student is on track. The additional support from student tutors that offer support lectures in difficult subjects or voluntary courses has already been outlined as outstanding.

Concerning international mobility in the COOP Education, the students also confirm that there is a central support unit where they can get information and help. Consequently, the students are content with the only small restriction that there is little opportunity for international mobility. According to the students' impression, it was generally possible to spend the COOP Education at a company abroad but none had ever done so due to the complicated organization. The peers gather that this aspect ought to be addressed in the future. Nevertheless, they have no doubt that currently the students receive all possible support to complete their studies successfully in due time.

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

The peers conclude that the criterion is largely fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:

Each course-content in the reviewed study programmes is reflected in exams, which are distributed in three examination periods/types during the semester: each course has a mid-term exam and a final examination while students have to pass a number of smaller tests or quizzes during the semester. The consequently high amount of exams during one semester was not considered problematic but helpful by the students since it allows for a continuous evaluation of each student's individual achievement. The students considered the information about examinations in the courses to be excellent; all information required was given in advance in the module descriptions or online and all course requirements including deadline or exam dates were conveyed at the beginning of the course. If there are any conflicts of dates during the examination period, an individual solution is always found. Apart from the mid-term and final examination, many courses include small projects or practical work that the students have to prepare during a certain period and afterwards present orally to the class. While the projects themselves are usually not part of the final grade, the oral presentation is so in several cases. Consequently, the peers were convinced that apart from written exams the students are being adequately trained in oral presentation skills as well. Each course entails a timeline that indicates the deadline until when students can withdraw from the course without consequences. Afterwards, if the student fails, he has to re-take the whole course rather than just repeat the exam.

The peers were provided with a selection of exams to check and they agreed that these generally represented an adequate level of knowledge as required by the EQF-Level 6. However, as has been outlined already, the programmes still lack a final project of a size and academic depth equivalent to a Bachelor thesis or comparable capstone project. Such projects are being introduced gradually with the developing curricula and the peers support the coordinators and teacher in this process in order to close this final gap to international examination standards.

In conclusion, the peers saw that all relevant examination regulations are in place and well communicated in a transparent way. The forms of exams are oriented toward the envisaged learning outcomes of the respective courses and the workload is distributed in an acceptable way.

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

The peers conclude that the criterion is completely fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:
- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:
During the discussions on site, the peers had active exchange with a variety of staff members from both programmes and gained the impression that the quality of this very international staff was absolutely adequate for the management of the programmes under review. Nevertheless, they did not yet receive a complete staff handbook with short CVs and publication lists of all staff members. It had been agreed that this material should be provided in the aftermath of the visit. In any case, the peers were convinced that the number of staff assigned to the programmes was sufficient to sustain them properly. As was outlined before, the peers were impressed by the international staff and their great dedication as well as their academic qualification. The number of the staff is regulated by the government and thus ensures an adequate provision. If the number of students increases, the number of teaching staff will be equally increased in order to guarantee a good student-teacher-ratio.

Criterion 4.2 Staff development

Evidence:
- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:
The University of Hail claims to set a special focus on professional development through the Skills Development Deanship on University level. This unit organizes workshops and seminars, which aim at sustaining different didactical, communication and professional skills, raising awareness of self-development and using new teaching methods.

An even more important aspect of professional development at this young university is the improvement of research activities. The staff members and programme coordinators agreed that in this regard there is still much room for improvement. However, substantial

university and governmental support progressively enhances the research opportunities of staff members. Schedules for professors are usually designed in a way to ensure that they have sufficient spare time for research and if staff members apply for a promotion, 60% of the required points are research-based. In addition, staff members outlined that they expect the introduction of Master programmes for the respective areas to be very helpful. Only then will they have students at hand who can be integrated as an active part into the research projects of the professors. The peers agree with this opinion and express their support for the introduction of the Master programmes as outlined during the discussions.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report
- Audit discussions
- On-site-visit

Preliminary assessment and analysis of the peers:
During the on-site visit, the peers inspected the research and teaching facilities of the programmes and considered the available equipment to be of highest standards. The newly constructed premises are spacious and offer ample opportunities for the professional and individual development of students and teachers. The students confirmed that they are also provided with free Computer software and are given easy access to all necessary rooms and equipment.

Especially impressing was the recently established Fab-Lab, a research laboratory open to all students as well as stakeholders and interested public in general. Here students can follow their own projects using modern equipment. Several outstanding project results and ongoing development were presented to the peers, underlining that the students actively use the Fab-Lab and thus that the facilities provide great space for their personal creative development.

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

The peers conclude that the criterion is completely fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:
- COE Module descriptions
- ICS Module descriptions

Preliminary assessment and analysis of the peers:
The peers appreciated the module descriptions presented beforehand with the self-assessment report. For most subject-specific courses, descriptions were made available and are accessible to the students. They give full information about the courses, examinations, contents, learning outcomes and recommended literature. The peers realized that descriptions for non-CS-modules were missing and they asked the staff to provide the additional descriptions, in particular of the Mathematics courses as well as the subject-specific electives. These ought to have been provided in the aftermath of the visit.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:
- Self-Assessment Report

Preliminary assessment and analysis of the peers:
Along with the graduation certificate, all students receive a Diploma Supplement including information about the college, courses included into the degree, as well as the grades of the courses and the structure of the degree. However, the peers asked to see exemplary Diploma Supplements for both courses and were promised to receive them in the aftermath of the on-site-visit.

Criterion 5.3 Relevant rules

Evidence:
- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:

The peers realized that regulations for every important aspect of student life and the respective degree programmes have been issued by the HEI and are accessible to the students through the University website. During the discussion with the students, it became clear that all participants knew perfectly well where to find any regulations or whom to contact if any additional information was required.

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

The University of Hail provides the requested module descriptions and exemplary versions of the diploma documents in the aftermath of the on-site-visit. The peers notice that the diploma supplements feature a cross-reference to the university homepage for the access requirements and the programme requirements. As the website may change over the years, this information might change as well. The programme details are only generically referred to. The peers are of the opinion that the access requirements, the programme requirements and the programme details should be clearly stated in the diploma supplement. Consequently, the peers consider this criterion to be partly fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Audit discussions

Preliminary assessment and analysis of the peers:

From the documentation and the on-site-visit, it became obvious to the peers that with the foundation of the University of Hail a multifaceted quality management system was established that aims at a constant development and improvement of the procedures, the programmes and all individual stakeholders.

As became apparent from the several discussions students, teachers, industry partners and especially programme coordinators are heavily involved in the programme development process and several mechanisms are in place to ensure that the programme contents are constantly up to date.

In order to receive feedback there is a variety of surveys and questionnaires that ensure that all stakeholders are included and questioned on a regular basis. Most importantly, the students answer a survey about each course, their teacher and the course content every semester, which is then evaluated on a higher level. The results of the surveys are channelled back to the teacher who then reflects on the course and the survey results in a report as well as an action plan for the following semester. These reports are sent to and analyzed on a central level by the Deanship of Quality Development. At the beginning of the following semester, each teacher discusses the improvement plan with the new students and outlines what has been criticized by the previous students and what measures he wants to adopt in order to improve the situation. Therefore, the peers generally consider the feedback loops to be closed although it would be desirable to give a personal feedback not only to the students of the next semester but to those that actually participated in the survey. This might help to encourage their participation and signal to them that their remarks are not lost on the way. Besides this course evaluation, there are also surveys of graduates and industry partners that help to adapt the programmes to the requirements of the job market.

While this is the official and institutionalized way for feedback, the peers also gained a very good impression of the informal feedback mechanisms that are in place in the programmes under review. Both students and teachers confirmed that there is a close relationship between them and that teachers can always be contacted if something needs to be addressed, improved or criticized. If any problems occurred an easy solution favourable to everybody could usually be found. In addition, students have their personal supervisor whom they can contact for assistance and there are students representatives in the most important quality assurance bodies. In conclusion, the peers thought the quality management system at the University of Hail to be exemplary in the Kingdom of Saudi Arabia.

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

The peers consider the criterion to be completely fulfilled.

D Additional Documents

Before preparing their final assessment, the panel asks that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

D 1. Exemplary Diploma Supplements for both programmes

D 2. Module descriptions for the non-CS-modules, in particular for the Math courses, the subject-specific electives and the modules on Islamic religion

D 3. Staff Handbook

E Comment of the Higher Education Institution (01.02.2019)

The institution agreed with the peers' assessment and attached the following additional documents:

- Exemplary Diploma Supplement
- Module Descriptions for the non-CS modules
- Staff Handbook

F   Summary: Peer recommendations (18.02.2019)

Taking into account the additional information and the comments given by 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
Computer Science	With requirements for one year	Euro-Inf	30.09.2024
Computer Enginee-ring	With requirements for one year	Euro-Inf	30.09.2024

Requirements

A 1.   (ASIIN 1.3) Both programmes need to have a capstone project of adequate academic level comparable to EQF level 6.

A 2.   (ASIIN 5.3) Ensure that the Diploma Supplement contains detailed information about the educational objectives and intended learning outcomes of the degree programme.

Recommendations

E 1.   (ASIIN 1.3) It is recommended to further strengthen aspects of IT Security, Theoretical Computer Science and Programming languages apart from Java in the curricula.

E 2.   (ASIIN 2.2) It is recommended to indicate the workload of the COOP Education in expected working hours comparable to the ECT System.

G Comment of the Technical Committee 04 – Informatics (19.03.2019)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedures of the male and female Cluster. They largely agree with the assessment of the peers. Concerning the male Cluster they propose to add the explicit reference to the statistical data according to the ECTS-Users'-Guide to the already existing requirement 1. Further, they deem it helpful to add the recommendation to strengthen the students' ability in conducting research and scientific writing as was envisaged by the female peer group.

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

The Technical Committee deems that the intended learning outcomes of the degree programmes 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
Computer Science	With requirements for one year	Euro-Inf	30.09.2024
Computer Enginee-ring	With requirements for one year	Euro-Inf	30.09.2024

Requirement
A 1. (ASIIN 1.3) Both programmes need to have a capstone project of adequate academic level comparable to EQF level 6.

A 2. (ASIIN 5.3) Ensure that the Diploma Supplement contains detailed information about the educational objectives and intended learning outcomes of the degree programme and including statistical data according to the ECTS-Users' guide in addition to the final grade.

Recommendations

E 1.   (ASIIN 1.3) It is recommended to further strengthen aspects of IT Security, Theoretical Computer Science and Programming languages apart from Java in the curricula.

E 2.   (ASIIN 1.3) It is recommended to train students in conducting research and scientific writing.

E 3.   (ASIIN 2.2) It is recommended to indicate the workload of the COOP Education in expected working hours comparable to the ECT System.

H Decision of the Accreditation Commission (29.03.2019)

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

The Committee discusses the procedure and agrees with the assessment of the peers and proposed synchronization between male and female campus made by the Technical Committee.

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

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

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Computer Science	With requirements for one year	Euro-Inf	30.09.2024
Computer Enginee-ring	With requirements for one year	Euro-Inf	30.09.2024

Requirement
A 1. (ASIIN 1.3) Both programmes need to have a capstone project of adequate academic level comparable to EQF level 6.

A 2. (ASIIN 5.3) Ensure that the Diploma Supplement contains detailed information about the educational objectives and intended learning outcomes of the degree programme and including statistical data according to the ECTS-Users' guide in addition to the final grade.

Recommendations
E 1. (ASIIN 1.3) It is recommended to further strengthen aspects of IT Security, Theoretical Computer Science and Programming languages apart from Java in the curricula.

E 2.   (ASIIN 1.3) It is recommended to train students in conducting research and scientific writing.

E 3.   (ASIIN 2.2) It is recommended to indicate the workload of the COOP Education in expected working hours comparable to the ECT System.

I   Fulfilment of Requirements (20.03.2020)

Analysis of the peers and the Technical Committee (09.03.2020)

Requirements

For all degree programmes

A 1.   (ASIIN 1.3) Both programmes need to have a capstone project of adequate academic level comparable to EQF level 6.

Initial Treatment	
Peers	not fulfilled Justification: It is not clear from the submitted module descriptions whether there is a capstone project in each of the programmes nor whether it is of an adequate academic level comparable to EQF level 6. The modules for which the HEI submitted module descriptions do not fulfil the expectations for an adequate capstone project. A new study plan shows that both study programmes now contain the modules "graduation project I and II". However, the HEI does not submit any module descriptions for these new modules.
TC 04	not fulfilled Vote: unanimous Justification: The Technical Committee follows the decision of the peers.

A 2.   (ASIIN 5.3) Ensure that the Diploma Supplement contains detailed information about the educational objectives and intended learning outcomes of the degree programme and including statistical data according to the ECTS-Users' guide in addition to the final grade.

Initial Treatment	
Peers	Fulfilled Justification: The HEI submits amended Diploma Supplements which now contain detailed information about the educational objectives and intended learning outcomes of each degree pro-

	gramme, as well as statistical data according to the ECTS-Users' guide.
TC 04	fulfilled Vote: unanimous Justification: The Technical Committee follows the decision of the peers.

Decision of the Accreditation Commission (20.03.2020)

The Accreditation Commission discusses the fulfilment of the requirements and agrees with the peers' and the Technical Committee's opinion. It regards requirement 1 as not yet fulfilled and requirement 2 as fulfilled.

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Computer Science	Requirement 1 not fulfilled	Euro-Inf	6 months prolongation
Computer Engineering	Requirement 1 not fulfilled	Euro-Inf	6 months prolongation

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 <u>Computer Science</u>:

"1 Knowledge

1.1 Define the fundamentals of hardware components and their functionality.

1.2 Recall the components of programming languages, software systems, and their objectives.

1.3 Memorize the knowledge of science and technologies appropriate to the discipline.

1.4 Memorize the concept of mathematics to the Computer Science applications.

1.5 Recall the ethical issues and Islamic culture.

1.6 Describe and practice Arabic and English Languages.

1.7 Practice of physical body exercise and activities.

1.8 Differentiate between distinct measurements, techniques and models used to solve computer problems.

1.9 List the computing requirements and processes relevant to Computer Science problems.

1.10 Select appropriate strategies to obtain optimal solution for computer applications.

2 Cognitive Skills

2.1 Discuss the aspects and differences between main computer architecture families.

2.2 Apply different techniques to understand and use software components and programming structures.

2.3 Design systems by applying efficient methodologies.

2.4 Analyze the problems and their solution using different tools and measurements.

2.5 Design solutions to the problems using varied techniques and models.

2.6 Apply the concepts of science and mathematics in problem-solving.

2.7 Evaluate different computer systems.

2.8 Formulate correct expressions using Arabic and English languages.

2.9 Justify the solutions of the problems using suitable methods.

2.10 Integrate knowledge and technology from several disciplines related to Computer Science to obtain high-quality applications.

2.11 Show critical awareness of current problems and/or new insights in their chosen specialist area

3 Interpersonal Skills & Responsibility

3.1 Apply the ethical standards and legal rules related to computer and information technology.

3.2 Show responsibility and accountability for continued personal and professional learning.

3.3 Develop working skills in terms of independence and leadership in computer projects.

3.4 Demonstrate effective cooperation during teamwork.

3.5 Demonstrate adequate skills of reasoning in solving computing problems.

4 Communication, Information Technology, Numerical

4.1 Assess the effectiveness of different methods in hardware techniques and technologies

4.2 Demonstrate an appropriate level of numerical skills related to computing.

4.3 Demonstrate presentation, reports and documentation skills.

4.4 Interact effectively using different communication skills to present high quality of computer applications.

4.5 Utilize information technology tools to collect, analyze and interpret topics related to Computer Science.

4.6 Illustrate the usage of new trends in programming languages and system software.

5 Psychomotor

5.1 Experiment with modern design tools professional and safe manner.

5.2 Develop optimal solutions for a range of problems using programming languages."

The following **curriculum** is presented:

Computer Science Plan

First Year (Preparatory)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
MATH001	Preparatory Math I	3	1	4		MATH001	Preparatory Math II	3	1	4	MATH 101
ENGL 001	Preparatory English I	15	5	8		ENGL 001	Prep.English II	15	5	8	ENGL 001
PREP 001	Univ. Study Skills	2	0	2		PREP 004	Introduction to Eng.	0	2	1	
PREP 002	Prep. Natural Science	0	2	1		PREP 002	Prep. Shop II	0	2	1	
PE 001	Prep. Physical Educ. I	0	2	1		PE 001	Prep. Physical Educ. II	0	2	1	
		20	10	16				18	12	15	

Total credit hours required in Preparatory Program: 31

Second Year (Freshman)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
CHEM 101	General Chemistry I	3	4	4		ENGL 102	English Compos. II	3	0	3	ENGL 101
ENGL 101	English Compos. I	3	0	3		IAS 111	Belief & its Conseq.	2	0	2	
MATH 101	Calculus I	4	0	4		ICS 102	Computer Program.	2	3	3	MATH 101
PE 101	Physical Education I	0	2	1		MATH 102	Calculus II	4	0	4	MATH 101
PHYS 101	General Physics I	3	3	4		PE 102	Physical Education II	0	2	1	PE 101
IAS 101	Practical Grammar	2	0	2		PHYS 102	General Physics II	3	3	4	PHYS 101
		15	9	18				14	8	17	

Third Year (Sophomore)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
COE 200	Fund. of Computer Eng.	3	3	4	PHYS 101	ICS 202	Data Structure	3	3	4	ICS 201
ENGL 214	Technical Report Writing	3	0	3	ENG 102	ICS 232	Computer Org & Assembly Program.	3	3	4	ICS201&COE200
ICS 251	Foundation of Computer Science	3	0	3	MATH 101	ICS 252	Discrete Structures	3	0	3	MATH101&ICS102
ICS 201	Introduction to Computer Science	3	3	4	ICS 102	XE xxx	General Elective I	3	0	3	
MATH 201	Calculus III	3	0	3	MATH 102	MATH 260	Intro. to Diff. Eq& Lin. Algebra	3	0	3	MATH 201
		15	6	17				15	6	17	

Fourth Year (Junior)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
COE 308	Computer Architecture	3	0	3	ICS 232	IAS 311	Islamic Shariah	2	0	2	IAS 211
ICS 313	Fund. of Programm. Language	3	0	3	ICS 202	ICS 432	Computer Networking Systems	3	3	4	ICS 232
ICS 334	Database Systems	3	3	4	ICS 202	ICS 413	Software Engineering	3	3	4	ICS 202
ICS 353	Des.& Analysis of Algorithms	3	0	3	ICS 202	ICS XXX	ICS Elective I	3	0	3	
IAS 211	Ethics in Islam	2	0	2	IAS 111	XE xxx	General Elective II	3	0	3	
STAT 319	Prob. & Stat	2	3	3	MATH 201	IAS 201	Objective Writing	2	0	2	IAS 101
		16	6	18				16	6	18	

	Summer Session				
ICS 350	Summer COOP	0	0	0	ENGL 214& ICS334& ICS313

Fifth Year (Senior)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
						ICS 411	Senior Project I	1	6	3	ICS 334, ICS413, ENGL 214
						ICS 431	Operating Systems	3	3	4	ICS 232
ICS 351	COOP Education	--	--	9	ENGL 214& ICS334& ICS313	IAS 301	Literary Styles	2	0	2	IAS 201
						ICS XXX	ICS Elective II	3	0	3	
						ICS XXX	ICS Elective III	3	0	3	
						XE xxx	General Elective III	3	0	3	
		--	--	9				15	9	18	

Total Requirements (132 credit hours)

1. **Elective Courses (9 - Credit Hours).**

Course Number	Course Name	Credit			Prerequisite
ICS 381	Intro to Artificial Intelligence	3	0	3	ICS 202
ICS 434	Advanced Database Systems	3	0	3	ICS 334
ICS 435	Computer Graphics	3	0	3	ICS 202
ICS 481	Neural Networks	3	0	3	ICS 381
SWE 344	Internet Protocols & C/S Prog	2	3	3	ICS 202
SWE 423	Multimedia Systems	3	0	3	ICS 202
SWE 444	Internet & Web App Development	3	0	3	ICS 334

1. **Free Elective Courses (9 - Credit Hours).**

Course Number	Course Name	Credit			Prerequisite
ECON 101	Principles of Economics 1	3	0	3	--
ECON 202	Principles of Economics 2	3	0	3	ECON 101
ECON 403	Engineering Economics	3	0	3	--
MGT 301	Principles of Management	3	0	3	--
MGT 311	Legal Environment	3	0	3	--
MGT 401	Human Resources Management	3	0	3	MGT 301
MGT 410	Organization Behaviour & Design	3	0	3	MGT 301
MKT 301	Principles of Marketing	3	0	3	ECON 202

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. Knowledge

1.1 Define the fundamentals of hardware components.

1.2 Define the fundamental components of software systems and programming languages and their objectives.

1.3 Memorize the knowledge of science and technologies appropriate to the discipline.

1.4 Recall the mathematical knowledge appropriate to the COE and related sciences

1.5 Recall the ethical issues and Islamic culture

1.6 Describe and practice Arabic and English Languages

1.7 Practice of physical body exercise and activities

1.8 Recognize the different representations and techniques used by different applications to solve a computer problem.

1.9 Describe the basic principles of circuit design.

1.10 Define the structures of networking systems and their objectives.

2. Cognitive Skills

2.1 Recognize the features and differences between main computer architecture families.

2.2 Apply different techniques to understand, and use software components and programming structures.

2.3 Design digital systems with large-scale with different options and alternatives.

2.4 Analyze the problems and their solution using different tools.

2.5 Design solutions for the computing problems using different representations, tools, techniques, and models.

2.6 Apply the concepts of science and mathematics in problem solving.

2.7 Evaluate different computer systems.

2.8 Formulate correct expressions using Arabic and English languages.

2.9 Differentiate between various communication and networking models.

2.10 Analyze different electronic circuits with semiconductor devices.

3. Interpersonal Skills & Responsibility

3.1 Apply ethical and high moral standards in both private and public environments.

3.2 Demonstrate accountability for continued personal and professional learning and development

3.3 Acquire the skills of working independently and as in groups including leadership responsibilities.

3.4 Demonstrate necessary skills of communication and teamwork.

3.5 Demonstrate adequate skills of negotiation and effective discussions.

4. Communication, Information Technology, Numerical

4.1 Assess the effectiveness of different methods in circuit simplification and computer architectures

4.2 Demonstrate an appropriate level of numerical skills related to computing.

4.3 Demonstrate presentation, reports, and documentations skills.

4.4 Use different communication skills to present high quality of Computer Engineering fields.

4.5 Use several tools of information technology to gather, analyze, and interpret topics related to computer engineering.

4.6 Illustrate the usage of new trends in programming languages and system engineering.

5. Psychomotor

5.1 Experiment with modern design tools in professional and safe manner.

5.2 Develop optimal solutions for a range of problems using programming languages.

5.3 Assemble electric and electronic components to construct complex circuits

5.4 Handle different types of equipment to develop different systems."

The following **curriculum** is presented:

Computer Engineering Plan

First Year (Freshman)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
CHEM101	General Chemistry I	3	4	4		ENGL 102	English Composition II	3	0	3	ENGL 110
ENGL 110	English Composition I	3	0	3		IC 101	Intro. To Islamic Culture	2	0	2	
MATH 101	Calculus I	4	0	4		ICS 102	Computer Programming	2	3	3	MATH 101
PE 101	Physical Education I	0	2	1		MATH 102	Calculus II	4	0	4	MATH 101
PHYS 101	General Physics I	3	3	4		PE 102	Physical Education II	0	2	1	PE 101
ARAB 101	Arabic Language Skill	2	0	2		PHYS 102	General Physics II	3	3	4	PHYS 101
		13	9	18				14	8	17	

Second Year (Sophomore)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
COE 200	Fund. of Computer Eng.	3	3	4	PHYS 102	ICS 202	Data Structure	3	3	4	ICS 201
EE 201	Electric Circuits I	3	3	4	PHYS102&MATH102	ICS 232	Computer Org & Assembly Program.	3	3	4	ICS201&COE200
IC 102	Islamic & Society Building	2	0	2		ICS 252	Discrete Structures	3	0	3	MATH101&ICS102
ICS 201	Introduction to Computer Science	3	3	4	ICS 102	EE-203	Electronics I	3	3	4	EE 201
MATH 201	Calculus III	3	0	3	MATH 102	MATH 260	Intro. to Diff. Eq. & Lin. Algebra	3	0	3	MATH 201
		14	9	17				16	9	18	

Third Year (Junior)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
STAT 319	Prob. & Stat	2	3	3	MATH 201	COE 308	Computer Architecture	3	0	3	COE 305
COE 305	Microcomp. Syst. Design	3	3	4	ICS 232	COE 344	Computer Networks	3	3	4	COE 341
ICS 334	Data base Systems	3	3	4	ICS 202	COE 390	Seminar	1	0	1	
ENGL 214	Technical Report Writing				ENG 102	COE 360	Princi. of VLSI Desg.	3	0	3	EE 203
						COE 4xx	COE Elective	3	0	3	
COE 341	Data & Computer. Comm.	3	0	3	COE 200	XE xxx	General Elective I	3	0	3	
IC 103	Economic System In Islam	2	0	2		ARAB 102	Arabic Composition	2	0	2	
		16	9	19				18	6	19	

Summer Session

Course	Title	Lec	Lab	CRD	Prerequisite
COE 350	Summer COOP	0	0	0	ENGL 214R ICS334& COE344

Fourth Year (Senior)

Course	Title	Lec	Lab	CRD	Prerequisite	Course	Title	Lec	Lab	CRD	Prerequisite
						COE 400	System Design Lab	1	6	3	COE 305
						COE 4xx	COE Elective	3	0	3	
COE 351	COOP Education	--	--	9	ENGL 214R ICS334& COE344	ICS 431	Operating Systems	3	3	4	ICS 232
						XE xxx	General Elective II	3	0	3	
						IC 104	The Political System in I	2	0	2	
						COE xxx	COE Elective	3	0	3	
		--	--	9				15	9	18	

1. **Elective Courses (9 - Credit Hours).**

Course Number	Course Name	Credit			Prerequisite
COE 405	HDL Modeling of Digital Systems	3	0	3	COE 308 OR CI (Consent of Instructor)
COE 410	Design of Sequential Systems	3	0	3	COE 308
COE 420	Parallel Computing	3	0	3	COE 308
COE 446	Mobile Computing	3	0	3	COE 344 OR CI
COE 462	Design Automation of VLSI Circuits	3	0	3	COE 360 OR CI
COE 488	Data Acquisition Interfacing	3	0	3	COE 305
ICS 353	Design and Analysis of Algorithms	3	0	3	ICS 202 & ICS 252
ICS 490	Special Topics 1	3	0	3	
ICS 491	Special Topics 2	3	0	3	

2. **General Elective Courses (6 - Credit Hours).**

Course Number	Course Name	Credit			Prerequisite
ECON 101	Principles of Economics 1	3	0	3	--
ECON 202	Principles of Economics 2	3	0	3	ECON 101
ECON 403	Engineering Economics	3	0	3	--
MGT 301	Principles of Management	3	0	3	--
MGT 311	Legal Environment	3	0	3	--
MGT 401	Human Resources Management	3	0	3	MGT 301
MGT 410	Organization Behavior & Design	3	0	3	MGT 301