ASIIN Seal & EUR-ACE® Label

Accreditation Report

Bachelor's Degree Programmes

Mobile & Network Engineering
Computer & Communication Engineering

Provided by
Ahlia University Bahrain

Version: 27 June 2025

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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]
البكالوريس في هندسة الهاتف الجوال و الشبكات	Mobile & Network Engineering	ASIIN, EUR-ACE®	/	02, 04
بكالوريس في هندسة الحاسب الالي و الاتصالات	Computer & Communication Engineering	ASIIN, EUR-ACE®	/	02, 04
Date of the contract: 03.02.2021 **Submission of the final version of the self-assessment report:** 17.11.2024 **Date of the onsite visit:** 27-28.02.2024 **at: Ahlia University, Manama, Bahrain**				
Expert panel: apl. Prof. Dr.-Ing. Reinhard Moeller, University of Wuppertal Prof. Dr.-Ing Moustafa Nawito, IUBH Internationale Hochschule/Polymath Analog Nils Barkawitz, Comma Soft AG Ali Maki, Student at University of Bahrain				
Representative of the ASIIN headquarter: Paulina Petracenko				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: European Standards and Guidelines as of May 15, 2015				

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

[2] TC: Technical Committee for the following subject areas: TC 02 - Electrical Engineering/Information Technology; TC 04 - Informatics/Computer Science.

ASIIN General Criteria, as of December 07, 2021 Subject-Specific Criteria Technical Committee 02 – Electrical Engineering/Information Technology as of September 23, 2022 Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science as of March 29, 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
Ba Computer & Communication Engineering (BSCCE)	بكالوريس هندسة / Bachelor of Engineering	Computer and communication	Level 6	Full time	NA	8 semesters	134 BH credit	2009
Ba Mobile & Network Engineering (BSMNE)	بكالوريس هندسة / Bachelor of Engineering	Telecommunication and network	Level 6	Full time	NA	8 semesters	134 BH credit	2009

In the Self-Assessment Report, Ahlia University presents itself accordingly:

"Ahlia University (AU) was established in 2001 as a private University Licensed by the Government of Bahrain. It is an autonomous not-for-profit University, independently chartered, funded and managed by the private sector. The university is operating in Manama, the capital of the Kingdom of Bahrain. AU began operations and admitted its first students in 2003. The University is independently governed by a Board of Trustees, which ensures there is a balance between financial self-reliance and academic excellence. Ahlia University offers 17 study programmes, in which altogether 2500 students are enrolled.

The College of Engineering offers two academic undergraduate programmes: Bachelor Degree in Computer and Communication Engineering (BSCCE) and Bachelor Degree in Mobile and Network Engineering (BSMNE). The two programmes have been offered by Ahlia University since the academic year 2007-2008. The qualification is designed to provide graduates with necessary background in the field of Computer Engineering. The qualification comprises 134 credit hours (548 NQF Credits). The qualification is delivered in English by the College of Engineering. "

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

For the Bachelor's degree programme Computer & Communication Engineering the institution has presented the following profile on their website:

"The Computer and Communication Engineering programme focuses on computer and communication engineering concepts and applications. The programme provides exposure to diverse cutting-edge technologies spanning computer architecture, microprocessors, embedded systems, digital signal processing, and modern digital and analogue communication systems.

The Computer and Communication Engineering undergraduate programme is under the Computer Engineering Department, which has a highly qualified and diverse team of academic staff that provide students with inspiration and quality education in the theory and practice of computer and communication systems. The Computer Engineering Department has computer engineering labs equipped with the latest tools and technology to build creativity and inspire innovation.

The Computer and Communication Engineering undergraduate programme is lined with the ABET accreditation to provide assurance that our programme meets the quality standards of the profession and give the BSCCE graduates an international accreditation for the national, GCC and international job market.

Graduates from the department of computer engineering have the opportunity to work as Computer engineer's, Telecommunication Engineer's, Communication Networks Engineer's and other career prospects in such growth areas as Telecommunications and Internet technology, Automotive and Traffic Technology, etc. Besides this, they have the opportunity to be instructors in universities after continuing their higher studies."

For the Bachelor's degree programme Mobile & Network Engineering the institution has presented the following profile on their website:

„The Bachelor's Degree programme in Mobile and Network Engineering (BSMNE) is a broad-based programme that provides the student with the technical knowledge and skills required to plan, design, construct and maintain telecommunications networks, equipment and facilities. This programme emphasizes an in-depth understanding of the technologies that support the local and global broadband digital networking, and mobile communication systems that are required for tomorrow's broadband-interactive information transmission.

Through this programme, students acquire an in-depth knowledge in wireless and mobile communications, Computer networks, network design, Network switching and routing, mobile device programming, modern digital and analogue communication systems, and

multimedia service convergences ensuring that graduates are fully prepared for employment within the sector. The several network courses embedded within the curriculum prepare students for professional certification such as Cisco CCNA and CCNP.

Graduates from the department of Telecommunication Engineering have the opportunity to work as Mobile Communications Engineer, Network Engineer, System Engineer, Mobile Network Planning Engineer, RF Cellular Engineer, and Network/ IT administrator. Besides, they have the opportunity to be instructors in universities after continuing their higher studies."

C Expert 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
- Study plans of the degree programmes
- Module descriptions
- Programme Specification per programme
- Objective-module-matrix per programme
- Websites of all study programmes
- Discussion during the audit

Preliminary assessment and analysis of the experts:
The learning outcomes including the objective-module-matrices can be found on the websites of the two study programmes, in the Programme Specification papers, and the Self-Assessment Report. A detailed description of the programme learning outcomes of the two study programmes under review is included at the end of this report.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Electrical Engineering and Information Technology and the Technical Committee Computer Science as a basis for judging whether the intended learning outcomes of the two programmes correspond with the competences as outlined by the SSCs.

The auditors confirm that the programme learning outcomes are transparently anchored and published and thus are available to students, lecturers and interested third parties. They also agree that the learning outcomes are described in a clear and concise manner.

[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.

Furthermore, the experts acknowledge that the intended learning outcomes cover different areas of competences; ranging from technical skills to academic and general/transferrable skills such as communication and social responsibility.

In the Mobile and Network Engineering programme students must acquire the following subject-specific-skills:

- Problem solving: Demonstrate creativity in solving engineering problems germane to mobile and network engineering.
- Modelling and Designing: Conduct engineering experiments in mobile and network system to meet desired needs within realistic engineering constraints using various concept.
- Application of Methods and Tools: Use specialized level of modern engineering tools necessary for engineering practice and experiments in mobile and network engineering.

According to the university, graduates from the department of Telecommunication Engineering should be able to work as Mobile Communications Engineer, Network Engineer, System Engineer, Mobile Network Planning Engineer, RF Cellular Engineer, and Network/ IT administrator.

In the Computer and Communication Engineering programme students must acquire the following subject-specific-skills:

- Problem solving: Demonstrate creativity in solving engineering problems germane to computer and communication engineering.
- Modelling and Designing: Conduct engineering experiments in computer and communication system to meet desired needs within realistic engineering constraints using various concept.
- Application of Methods and Tools: Use specialized level of modern engineering tools necessary for engineering practice and experiments in computer and communication engineering.

According to the university, graduates from the department of computer engineering have the opportunity to work as Computer engineer, Telecommunication Engineer, Communication Networks Engineer and other career prospects in such growth areas as Telecommunications and Internet technology, Automotive and Traffic Technology, etc.

The experts review the documents and confirm that the level of the objectives and intended learning outcomes of the two programmes adequately reflect EQF level 6. The programmes also meet the ASIIN Subject Specific Criteria (SSC) of the Technical Committee on Electrical Engineering and Information Technology and the Technical Committee on Computer Science. Overall, the reviewers consider that the targeted skill profiles of the two programmes under review are in high demand and will enable graduates to find appropriate employment both in Bahrain and globally.

However, when examining the curricula, the experts note that the courses are not fully aligned with the focus of the programme as indicated by the programme titles and with its intended learning outcomes. This is particularly the case for the Mobile and Network Engineering programme. Contrary to the programme name, the curriculum contains little content in the area of network and mobile engineering. Instead, the courses focus on general electrical engineering, network engineering, and sporadic elements of mobile application development. Therefore, the experts require that the name of the programme, its intended learning outcomes and its content are aligned. This is discussed in more detail in chapters 1.2 and 1.3.

Furthermore, the experts note that the two programmes under review are very similar in terms of intended learning outcomes and curricula. In fact, the curricula of the two programmes are almost identical in the first three academic years. Therefore, the experts ask why their university does not combine the two programmes into one, offering one track for Computer and Communication Engineering and another track for Mobile and Network Engineering. The programme coordinators explain that national regulations do not allow them to offer programmes with tracks. The experts understand this restriction, but emphasise that in this case the study programme should be made more distinct and include more content of the respective specialisation.

Nonetheless, the audit discussion with the industry partners shows that they are very satisfied with the qualification profile of the graduates, especially with the general and soft skills. However, their statements show that the qualification profiles of the graduates from both programmes are almost interchangeable, which confirms the experts' impression that the two programmes under review are not only very similar, but also do not contain sufficient distinctive elements reflecting their respective speciality. Nevertheless, the experts are pleased to hear that graduates from Ahlia University, and in particular from the two programmes under review, are in demand by companies throughout Bahrain.

Since the university also applied for the EUR-ACE® label, the experts check whether the learning outcomes are aligned with the EUR-ACE® Framework Standards and Guidelines (EAFSG) for engineering programmes. The EUR-ACE® Framework Standards and Guidelines

requires that engineering programmes cover the following seven competence areas: Knowledge and Understanding, Engineering Analysis, Engineering Design, Investigations, Engineering Practice, Making Judgements Communication and Team-working, and Lifelong Learning. The documents illustrate that the degree programmes under review cover all the required competence areas and the experts are convinced that the mentioned competences are conveyed in the respective courses. They conclude that the intended learning outcomes of all programmes are aligned with the EUR-ACE® Framework Standards and Guidelines (EAFSG).

With regard to the review of objectives and learning outcomes, the experts note that the university has put in place an impressive process to check that learning outcomes are in line with labour market requirements and research developments. This includes benchmarking programmes against national, regional and international universities. In addition, various industry partners are regularly consulted in the revision of the programmes. For example, both the Mobile and Network Engineering programme and the Computer and Communication Engineering programme were aligned with the HUAWEI ICT Academy for Internet of Things. In general, programmes are reviewed every three years, taking into account feedback from stakeholders and external evaluators. The experts confirm that the learning outcomes of both programmes are regularly reviewed and revised if necessary.

In conclusion, the experts believe that the learning outcomes of the two degree programmes adequately reflect the intended level of academic qualification and correspond with the ASIIN Subject-Specific-Criteria (SSC) of the respective technical committees and the EUR-ACE® Framework Standards and Guidelines (EAFSG).

Criterion 1.2 Name of the Degree Programme

Evidence:

- Self-Assessment Report
- Diploma per study programme
- Study plans for both programmes
- Audit discussions

Preliminary assessment and analysis of the experts:
The experts confirm that the titles of the study programmes (both in English and Arabic) are used consistently in all relevant documents.

However, the experts identify inconsistencies in the Mobile and Network Engineering bachelor's programme with regard to the correspondence between the title, the intended objectives and the teaching content. As mentioned in chapter 1.1, the programme contains

hardly any elements in the field of Mobile or Network Engineering. Thus, only three courses in the entire curriculum can be assigned to the field of Network Engineering: "Computer Networks", "Network Routing & Switching" and "Network Design & Security". In Mobile Engineering, there is only one module, "Mobile Application Development", which provides programming skills for mobile applications instead of mobile network technology. The remaining modules are embedded in the general areas of Electrical Engineering and Information Technology, and Computer and Communications Engineering. The experts therefore emphasise the need to ensure that the title of the programme, the intended learning outcomes and the curriculum are all consistent. To achieve this, the university can either change the title of the programme and the intended learning outcomes to match the curriculum, or change the curriculum to match the programme title and the intended learning outcomes. The experts suggest that if the title Mobile and Network Engineering is to be retained, the modules "Electronic Circuits" and "Computer Architecture and Organisation" could be removed from the programme (or alternatively offered as electives), as they do not provide a clear benefit to Mobile and Network Engineering education, and instead be replaced with more core modules in the field of Mobile and Network Engineering Technology.

With regard to the Bachelor's degree in Computer and Communication Engineering, the experts see a better alignment between the intended learning outcomes, the title of the programme and the curriculum. Thus, the programme has a sufficient number of core courses in the field of Computer and Communication Engineering that are in line with the title and contribute to the achievement of the objectives; however, the experts consider that the total number of core courses is still somewhat low and recommend increasing the number of core/mandatory courses that deal with Computer and Communication Engineering. In addition, the experts believe that the electives do not include enough courses in the area of computing and communications, and therefore recommend that the electives should have a stronger focus in this area. This is discussed in more detail in Chapter 1.3.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions

- Discussions during the audit

Preliminary assessment and analysis of the experts:
Content & Structure

The two Bachelor's programmes have a duration of four years (8 semesters).

As mentioned above, the curricula of the two programmes are to a large extent very similar: In the first year, students take general courses such as "Modern History of Bahrain" and "Academic English" and introductory courses in the field of engineering, including "Calculus", "Physics" and "Introduction to Programming Techniques". In the second and third years, students deepen their knowledge of electrical engineering. At the end of the third year, students must also complete an internship. The fourth year consists of more specialised core courses, electives and the Major Project, which includes the completion of a final thesis. In each programme, students can choose four electives from a catalogue of ten courses.

The detailed study plans for both programmes can be found at the end of this report.

After the audit discussions and the revision of the documents, the experts are of the opinion that both programmes provide a sound education in Electrical Engineering at EQF level 6. They confirm that both curricula are designed to provide students with the engineering competences required by the EUR-ACE® Framework Standards and Guidelines (EAFSG). Furthermore, the experts believe that each module represents a well-matched unit of teaching and learning.

However, in terms of technical skills, they consider that the curriculum of the Mobile and Network Engineering bachelor's programme is not designed in such a way that students acquire sufficient skills in the field of mobile and network engineering. As outlined above, the experts consider that the programme does not include enough courses in the field of its main focus; this refers to both compulsory and elective courses. As a result, the experts call for the programme title, objectives and curriculum to be aligned. In contrast, the Bachelor's degree in Computer and Communication Engineering contains fitting core courses in computer and communication sciences. However, the level of the core program should be strengthened and additionally more in-depth elective courses should be offered to specialize the students according to their intended programme learning outcomes. They therefore recommend the inclusion of more core courses in Computer and Communication Engineering. In addition, the experts consider that the electives offered in the programme are not sufficiently focused on the area of Computer and Communication Engineering. Thus, only three out of ten modules ("Principles of Control Systems", "Multimedia Communications" and "Optical Communications") can be allocated to this area.

In general, the experts note that the elective catalogue of the two programmes under review is very similar; in fact, five out of ten courses are identical. Consequently, if students are required to take four electives, there is a possibility that they will take all their electives in a field that is not the main field of their programme. For example, in Computer and Communications Engineering, students could take the courses 'Internet of Things', 'Cyber Security', 'Satellite and Space Communications' and 'Optical Communications' as electives. Similarly, Computer and Communications students could choose courses that do not offer further specialisation in their core field, such as 'Applied Robotics'. The experts believe that electives should allow students to specialise and deepen their knowledge in subsections of their main field of study. While they agree that a small percentage, such as one course in this case, could be taken from another discipline (to broaden the student's general knowledge), the experts insist that the majority of electives should be taken from their main discipline. Therefore, the experts require that the electives in both programmes should be in their technical specialisation. This implies increasing the number of programme-related electives and establishing guidelines or restrictions that prevent students from taking electives only in an unrelated field.

Internship

As mentioned above, students in both programmes are required to complete an internship at the end of the third academic year. The total workload for the internship is 240 hours over eight weeks. 224 hours are allocated to work-based learning, 2 hours to evaluation by the company and academic supervisors and 14 hours to reports and oral presentation.The overall mark for the internship is calculated as follows: company supervisor (50%), academic supervisor (10%), student bimonthly reports (20%) and a final report (20%). At the College of Engineering, students are also required to give a presentation on their experience (worth 5% of the final report). Once the assessment of the internship is completed, the results are entered into ADREG, an online learning platform, and the feedback is discussed in the Departmental Council for possible improvements of the internship.

The procedure for the internship as well as the roles and responsibilities of the academic supervisor and the field supervisor are defined in the internship guidelines. These responsibilities include ensuring that students achieve the objectives set for the internship. The internship is managed by a dedicated internship office, which also ensures that students are placed in appropriate organisations. During the audit the experts learn that alternatively the students can choose a company themselves. In this case, the company has to submit a paper in advance, describing the exact tasks that the students will carry out, in order to guarantee that the students will achieve the intended learning outcomes.

The experts consider that the internship is well integrated into the curriculum and that Ahlia University has adequate measures in place to ensure that the internship contributes to the learning outcomes of the programme. However, they note a miscalculation in the number of credits awarded to the internship, as the internship has a workload of 240 hours but is only awarded 3 Bahraini credits or 5 ECTS credits. This is discussed in more detail in chapter 1.5.

Student mobility

In order to promote student mobility, Ahlia University has a number of partner universities abroad, mostly in Europe and the United States. In particular, the university cooperates with Brunel University (London, UK), Georgetown University (Washington DC, US) and some universities in France, such as EPITA (Paris, France). The rectorate explains that students regularly take advantage of the opportunity to spend a semester abroad through these collaborations; in turn, Ahlia University welcomes students from these partner universities every year. Apart from these partnerships, however, the experts learn that the possibilities for student mobility are very limited. The Rectorate explains during the audit that the recognition of all academic achievements abroad is not only checked by members of Ahlia University, but also closely controlled by the Ministry, and that the Ministry has very strict regulations for the recognition of achievements acquired outside of Bahrain. For example, the intended learning outcomes of the modules at the foreign university must be exactly the same as the modules at the student's home university. In addition, the module to be recognised must have the same number of credits as the module to be replaced. For this reason, there are only few cases of students who have spent a semester abroad at a university that is not an official partner of Ahlia University. Nevertheless, Ahlia University emphasises that it encourages student mobility in all forms and assists students in planning their semester abroad.

The detailed regulations and procedures regarding student mobility are defined in the Study Abroad Policy. The policy stipulates that students must determine which courses can be recognised at Ahlia University before going abroad. After mobility, students must submit an official transcript to the Office of Admissions and Registration in the Office of Student Affairs, based on which credits will be awarded to the student in accordance with the External Transfer Policy,

With regard to the structural framework of mobility, the School of Engineering recommends that students go abroad in their third year. All information about the partner universities and the procedure for planning student mobility is available on the University's

website. If students have any questions or need guidance on the procedure, they can contact the International Relations Office, which is in charge of the administrative dimension of student mobility.

Students confirm that they are aware of the opportunities to go abroad and that they are satisfied with the options available. They also reported that there are students who regularly take advantage of the exchange programmes, although not so many.

The experts consider that the university offers appropriate exchange opportunities and adequate support for students planning to go abroad. They acknowledge the structural barriers posed by strict recognition rules and believe that, in these circumstances, the university is doing its best to promote student mobility.

Periodic Review of the Curriculum

As mentioned above, every programme at Ahlia University is thoroughly reviewed every three years. The evaluation of programmes takes into account feedback from all stakeholders. In addition, according to the University's academic policy, all courses are subject to an annual review. This includes evaluation of teaching, course content and equipment, as well as benchmarking. The students report that they are very satisfied with the two programmes under review, that their suggestions are usually incorporated into the programmes, and inform the experts that Ahlia University also has a very good reputation within Bahrain for meeting the needs of industry. The experts are pleased to hear that Ahlia University takes industry feedback very seriously when reviewing its programmes. In general, the reviewers conclude that there is a systematic process for regular review and improvement of programmes.

Criterion 1.4 Admission Requirements

Evidence:

- Admission Criteria- College of Engineering
- Admission Policy
- External Transfer Policy
- Student Handbook
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the experts:
Admission requirements are published on the university's website.

To be eligible to study at the College of Engineering, students must have a minimum of 70% in the national secondary school examination (Tawjihi), a specialisation in their secondary school certificate in either science, industry or general studies, and a certain level of English. The latter can be demonstrated by passing the University English Language Placement Test or by providing an English language certificate such as IELTS (more than 5.5 or its equivalent), TOEFL (more than 500 or its equivalent) or Cambridge ESOL SCE. Applications are assessed by the Directorate of Admission and Registration and the National Higher Education Council (HEC).

Candidates who do not meet the criteria in terms of academic score and specialisation may be conditionally accepted, subject to passing an interview and a college-level assessment.

Ahlia University also encourages the admission of students with special needs. The exact procedure and guidelines for the admission of students with special needs are published in a separate policy paper.

Applicants transferring from other undergraduate programmes are subject to the external transfer policy and procedure. The procedure is documented in the document “Accepting Transfer Applicants from other Higher Education Institutions Policy and Procedure” as well as in the “Rules for Transferring Students to Higher Education Institutions or Continuing Studies to Obtain a Higher Degree” issued by the Higher Education Council (HEC) of Bahrain. The latter serves as the national framework for the recognition of the achievements of students transferring institutions within Bahrain. The document stipulates that each institution must verify the student's academic record at the previous institution prior to recognition. Subsequently, the university (recognising the credits) must ensure that the courses previously studied are equivalent in content and credit hours to those offered at the university. The equivalence decisions must be approved by the appropriate academic bodies within the institution. Ahlia University states that it implements the process required by HEC, and in each case checks that the previous achievements are consistent with the course content and learning outcomes of the relevant Ahlia University programme. As an example, the university provides sample tables illustrating the recognition of specific courses.

The number of students admitted to the bachelor's degree in Computer and Communication Engineering has fluctuated slightly between 22 and 35 over the last five years. While there was a peak in 2020/21 with 35 students, the number of applicants and admitted students decreased slightly in the last years to 24 students in 2022/23. In the bachelor's programme Mobile and Network Engineering, the number of admitted students dropped from 26 in 2018/9 to 6 in 2022/23. The rectorate explains this with the general decrease in the number of applicants at the university in recent years. They inform the experts that the University of Bahrain, which is the largest and one of the two public universities in Bahrain,

has been admitting more and more students over the past few years; as a result, fewer students are choosing to attend one of the private universities in Bahrain, such as Ahlia University. Experts understand the slight decline in enrolment and appreciate the university's decision not to lower the standards of its programmes or admission requirements despite the declining numbers.

The programme-specific admission requirements are periodically reviewed by the university, in consultation with the Student Admissions Committee and the University Council, in relation to the results achieved and the history of academic progress.

In summary, the experts find that the admission requirements are binding and transparent. They confirm that the entry requirements support students in achieving the intended learning outcomes. They also acknowledge that members of Ahlia University devote considerable effort to the selection process and interviewing of applicants to ensure that suitable candidates are selected.

Criterion 1.5 Workload and Credits

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Student Handbook
- Discussions during the audit
- Student surveys
- Statistical data

Preliminary assessment and analysis of the experts:
A credit system has been introduced which assesses student workload and includes both contact hours and time for independent study. The system ensures that all required components are included in the curriculum, with credits awarded for each module according to the workload involved.

At Ahlia University, one Bahrain Credit (BC) corresponds to 40 hours of the student's total workload, including class attendance and independent study. Both the Computer and Communication Engineering and Mobile and Network Engineering bachelor's programmes comprise 134 BC each. The programmes are structured in such a way that 113 BC are dedicated to general and technical courses, 3 BC to the capstone project, 12 BC to programme electives, 3 BC to the internship and 3 BC to humanities courses.

At Ahlia University, almost every course has a total workload of 120 hours and is awarded 3 BC. In theoretical courses, 49 hours are devoted to lectures, 12 hours to assessments and 59 hours to independent study. For practical courses with a laboratory component, the breakdown is as follows: 22.5 hours for lectures, 16 hours for practical laboratories, 7.5 hours for assessments and 75 hours for independent study. For each course there is a scorecard in addition to the syllabus, which illustrates the calculation of workload in detail.

After reviewing the documentation, the experts consider that the internal calculation of workload is generally correct and includes contact hours as well as self-study time. However, they note that the conversion from Bahrain Credits to ECTS is inaccurate. The university states in the self-evaluation report that 1 BC is approximately equivalent to 1.791 ECTS. However, if 1 BC equals 40 hours and 1 ECTS equals 30 hours, the correct coefficient between Bahrain Credits and ECTS points is approximately 1BC=1,333 ECTS. This can also be seen from the module descriptions: a module with 3 BC has a total workload of 120 hours: 120 divided by 30 (h) equals 4 ECTS. However, according to the university's conversion rate, each course should be awarded 5.37 ECTS (3 x 1.791). Therefore, the experts require the university to convert Bahrain Credits into ECTS correctly. Another problem that arises is that each programme under review does not accumulate to 240 ETCS as stated by the university, but to approximately 178.67 ECTS. However, the ASIIN criterion requires that Bachelor's students must have earned at least 180 ECTS credits by the time they graduate. The university must therefore ensure that each of the Bachelor's programmes under review has a total of at least 180 ECTS points.

Another inconsistency is revealed when looking at the credits awarded for the internship. According to the self-assessment report, students spend 224 hours working in the company during the internship, 2 hours for the assessment by the industry and academic supervisors, and 14 hours for the reports and the oral presentation. This adds up to 240 hours. However, the workload is only awarded 3 BC, which would be equivalent to 120 hours. The programme coordinators explain during the audit that this is due to the fact that most of the workload is done by the students in the company and only a few hours are dedicated to contact hours. The experts understand the reasoning, but emphasise that the credits must take into account the student's total workload, including contact hours as well as independent study/work time. Therefore, the experts urge the university to ensure that the credits awarded are in line with the students' workload, which in the case of 240 hours would be 6 BC for the internship.

In general, the university monitors the student workload by asking students how they are coping with the workload. Students indicate in the audit that the workload is manageable and in line with the credit points awarded per module. They inform the experts that any kind of difficulty with the workload can be communicated to members of the university,

who in turn respond quickly and find solutions to the problem. The experts also consider the workload to be realistic and well balanced over the semesters.

According to the statistics provided by the university, students in both programmes under review take an average of 4 years to complete their studies. The experts are impressed by the fact that the vast majority of students actually graduate within the intended duration of the programmes. In addition to the careful design of the programmes, the experts consider the comprehensive and individual support provided to students to be a key factor in the high success rate.

In conclusion, the experts consider that Ahlia University has a sound credit system, which is based on student workload and is regularly monitored. However, the current conversion calculation between BC and ECTS needs to be corrected and the credit points for internships must be brought into line with the actual workload.

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:
In order to achieve excellence in teaching, Ahlia University has developed the Teaching and Learning Excellence Plan (2021-2025). Therefore, the didactic and teaching methodology at the College of Engineering is designed in accordance with the teaching plan and the intended learning outcomes of each programme. The curriculum is revised every five years. In order to monitor the implementation of the plan, each department is required to submit a detailed annual teaching progress report, which is forwarded to the Directorate of Strategic Planning for review and evaluation. As part of this review, it is regularly checked whether the teaching methods and results are in line with the objectives of the programme.

Consequently, teachers at Ahlia University use a variety of teaching methods and didactic approaches. The most common teaching methods are lectures, seminars, practical sessions and laboratory work. In addition, teaching is also based on virtual learning, flipped classroom and blended learning. Furthermore, the use of extracurricular and co-curricular activities has been increased in recent years as a result of the evaluation results. For example,

the College of Engineering regularly organises industry-based events, such as guest lectures by representatives from companies or from professional societies such as the Bahrain Engineering Society and professional bodies such as the IEEE Student Branch. The College also organises symposia, engineering days and field trips to encourage student participation. In addition, the college regularly enters a team of students in the Huawei ICT competition.

The University also places great emphasis on teaching students to conduct independent research. Therefore, students learn from an early stage the different steps of academic work, including literature review, research methodology, analysis, practical implementation and drawing defensible conclusions. In addition, the final project allows students to demonstrate their acquired skills in scientific work as well as critical thinking, problem solving and creativity. Students are also required to present their final projects at the Engineering Final Project Exhibition, organised by the College of Engineering. At the exhibition, industry members evaluate the students' projects.

When asked about the teaching methods, the students say that they are very satisfied with the different forms of teaching. They emphasise that the teachers put a lot of effort into ensuring that each student understands the subject. In addition, they use creative teaching methods that make the lessons highly interesting and ensure that students understand the subject in depth and not just memorise the material.

In summary, the expert group considers the teaching methods and tools to be highly appropriate to support students in achieving the intended learning outcomes. They confirm that the programme design incorporates a variety of teaching and learning methods and practical elements adapted to the specific subject culture and study format. The experts pay particular tribute to the highly committed and creative teaching staff, whose teaching is very well received by the students.

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

In response to the experts' request that the electives for both programmes should reflect the focus of the programme, Ahlia University submitted a proposal to change the system of electives. According to this proposal, the electives will be divided into two areas: one containing only courses directly related to the technical specialisation of the programme, and the other containing courses related to the discipline in a broader sense. Students are required to take two courses from each elective area. The experts welcome the rapid change implemented by Ahlia University and consider that this mechanism is sufficient to ensure that each student takes at least half of the electives in the direct area of specialisation of the programme. They consider the requirement to be met.

In response to the experts' request to ensure that the name of the Mobile & Network Engineering programme, its intended learning outcomes and its content are consistent, Ahlia University has decided to exchange two compulsory courses. Thus, the course "Computer Architecture" will be replaced by "Mobile Computing" and "Wireless Communication" will be replaced by "Network Management and Administration". The experts review the module descriptions of the two new modules and conclude that the substitutions are appropriate measures to include more mobile and network engineering content in the programme. Considering the changes made to the curriculum, i.e. the two new compulsory courses and the two elective courses that must be in mobile and network engineering, the experts conclude that the programme now includes sufficient content in this area so that the programme title, the intended learning outcomes and the curriculum are now in line with each other. They therefore consider the requirement to be met.

Regarding the recommendation to add more core or compulsory modules that reflect the focus of the Computer and Communication Engineering programme, Ahlia University does not submit any planned changes. The recommendation is therefore maintained.

Regarding the calculation of workload and the conversion of Bahrain Credits to ECTS credits, Ahlia University refers in its statement to the national regulation (based on the NQF), which defines that 1 BC (Bahrain Credit) is equivalent to 2 ECTS credits. Accordingly, each of the bachelor's programmes under review, with 134 BC, is equivalent to 264 ECTS credits. Ahlia University emphasises that it follows national rules for calculating workload and converting credits. However, based on the information provided by Ahlia University and the NQF handbook, which states that 1 NQF is equivalent to 10 hours, the experts calculate that 1 BC is equivalent to 40 hours and thus 1 ECTS credit would be equivalent to 22.8 hours (according to the university's calculation). However, according to the ECTS system, 1 ECTS credit has a range between 25 and 30 hours. Overall, the experts are not able to clarify the discrepancies and inconsistencies because there is no transparent information on how exactly the workload is calculated and how BC is converted into ECTS. For example, the NQF document states that 1 BC is equivalent to 2 ECTS credits, but does not explain how this equivalence rate has been calculated. Due to the confusing and inconsistent information, the experts request that Ahlia University provide transparent information on the calculation of workload and a correct conversion rate to ECTS.

In further discussion with the university, the experts learn that the information provided in the scorecard on the detailed distribution of workload is mandated by the Ministry, including the amount of independent student workload. As a result, the number of hours of students' self-study indicated in the Scorecard and used to calculate credits is predetermined and is not the result of the university's assessment of students' actual workload. In fact, the

experts recognise that there is no official information at all on the actual workload of students, as this data is not assessed. The university simply asks students whether they think the workload is manageable and provides support if there are problems. It is therefore quite possible that student workload is actually higher than indicated in the scorecard. This would explain the inconsistencies in the workload and credit calculations, as the university might expect the actual workload to be higher than the official figures. For these reasons, the experts urge Ahlia University to establish a monitoring system that regularly assesses students' actual workload (e.g. through surveys) and documents these figures transparently (e.g. in module descriptions). The university must then ensure that the credits awarded for each curricular unit correspond to the entire student workload, including contact hours and the actual student self-study time. On this basis, a coherent and accurate calculation of the conversion from BC to ECTS should be demonstrated.

With regard to the experts' request to align the number of credits awarded for the internship with the workload of the internship, the university proposes to award 3 BC (or 6 ECTS if 1 BC equates to 2 ECTS) for the internship. However, the experts point out that this still does not correspond to the total workload of 240 hours. If 1 BC is equivalent to 40 hours, the internship must be awarded 6 BC. The requirement is therefore maintained.

Criterion partly fulfilled.

2. Exams: System, Concept and Organisation

Criterion 2 Exams: System, Concept and Organisation

Evidence:

- Assessment Manual
- sample exams & exam feedback
- Self-Assessment Report
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

All examination-related regulations and policies are set out in the Ahlia University Assessment Manual. It provides information on the assessment schedule, methods, marking criteria and procedures, and guidelines for assessing student achievement of course learning

outcomes. It also defines the procedure for student complaints and appeals, academic misconduct, plagiarism and sanctions. The Assessment Manual is regularly revised, taking into account feedback from all stakeholders. The assessment manual is published online and is available to all stakeholders. In addition, a summary of student rights and responsibilities in relation to assessments is included in the student handbook.

According to the self-evaluation report, the assessment forms are designed on the basis of a detailed procedure for the achievement of the ILOs, which ensures that the ILOs are achieved at course level. The achievement rate set for each ILO is evaluated each semester and if the ILO does not achieve 60% of the achievement rate, improvement is considered at departmental level.

The module descriptions show that a variety of examination forms are used in the two programmes under review. These include homework/assignments, tests, quizzes, group projects (including a report and presentation), laboratory reports, major exams, laboratory final exams, research projects, final exams and oral participation. The choice of specific forms of assessment and their weighting varies from course to course. For example, more practical courses include practical assessment forms such as lab reports, lab exams and research projects. Oral participation, for example, is only assessed in the English and Arabic language courses. A common feature of all courses is that students' progress is assessed throughout the course, for example through quizzes and mid-term exams, and that there is a final exam at the end of the course. The final exam usually accounts for 40% of the course grade. Detailed information about the assessment forms and the calculation of the grade is given in the mapping score-card which is available for each course. It also includes information on how much time is allowed for students to prepare the examination forms and for the examination itself.

All assessments weighing more than 20%, such as the final examination, are also assessed by external moderators. They check the assessment methods used, their compliance with the ILOs, the fairness of the weighting, the accuracy of the marking and the fairness of the grades awarded. Once the external examiner's feedback has been received, the comments are discussed in the Departmental Council and the grades are approved internally in accordance with University procedures.

The dates of the final examination period are specified in the academic calendar for each semester. They are usually held after the last day of classes. The final examination schedule is published at the beginning of each semester. In addition, students in each course are given a clear schedule of course assessments at the beginning of the semester, together with information on the topics and ILOs covered in each assessment and the assessment and grading criteria and guidelines used in the course.

The ADREG student portal allows students to view the results of their course grades. ADREG can also be used to submit complaints or queries to the Director of Student Services. All students are informed of their right to make a complaint at the Student Orientation prior to the start of each course. Once a complaint has been submitted, it will be forwarded by the Head of Student Support to the relevant staff for timely resolution.

During the audit, the experts learn that Ahlia University does not offer the possibility of retaking an exam. If students have failed the course, they can appeal and have the exam re-examined; this process involves three examiners. If the review reveals that the student has still failed the course, the student must repeat the course. The programme coordinators emphasise that each course is offered every semester. Students may repeat courses up to three times. In addition, the programme coordinators point out that there is a monitoring system that keeps track of students' grades. If a student's performance deteriorates significantly and the student is on the verge of failing the course, academic staff are alerted and speak to the student.

The University also has mechanisms in place to support students with special needs in relation to examinations. The members of the Special Needs Committee aim to provide each student with the most appropriate learning environment.

After reviewing the documentation and examination samples and conducting the audit interviews, the experts conclude that Ahlia University has a sound examination system in place. They confirm that a variety of competence-based assessment forms are used in the two programmes under review, which are adequate to assess the achievement of the course and programme learning outcomes. They also note positively that the assessment forms are reviewed regularly and that the whole assessment system is monitored to ensure fairness and appropriateness. Furthermore, they consider that the level of the examinations is appropriate and corresponds to EQF level 6.

Students echo the experts' satisfaction with the examination: They report that they receive all relevant information such as examination dates and assessment criteria at the beginning of the semester. If an examination date is inconvenient for a student, he or she can suggest a postponement, which is then taken into account by the teacher. The examination policy, including the compensation policy, is made transparent to all concerned. When asked about the workload and the difficulty of the examinations, students say that both are appropriate and manageable.

In the fourth academic year, students must complete a final project. The procedure and regulations for the final project are set out in the Guidelines for the Undergraduate Project, available on the University's website. The main task of the student is to solve a real engineering problem using academic methods. All stages of the project must be documented.

The course syllabus includes a detailed milestone plan to guide the students. Students' progress is monitored regularly by two internal supervisors. At the end of the semester, the student must submit a report and defend a presentation.

After reviewing the module descriptions, the experts are confused about the scope of the project as the “Major Project” module is only worth 3 Bahrain credits. The programme coordinators explain that the work on the project is actually covered in two modules: In the first semester of the fourth year, students in both programmes take the module "Research Methods in Information Technology & Engineering" (3 BC/4 ECTS). In this module, students prepare the project proposal and define their methodology. The coordinators emphasise that the idea for the projects is not provided by the College, but must come from the students themselves and is further developed under the guidance of the two supervisors. After the scientific preparation, the students carry out the actual project in the “Major Project” module, which takes place in the second semester of the fourth year. Consequently, the workload for the entire project is 6 BC or 8 ECTS points in total. The experts are pleased to hear that students first build the methodological basis and then carry out the actual project. They also like the fact that students have to find a topic for their project themselves, which requires them to study the needs of the industry and identify problems or gaps in the field. Having reviewed the thesis samples, the experts are of the opinion that both programmes include a final project which demonstrates that students are able to work independently on an engineering task at EQF level 6.

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

According to the experts, the criterion is fully met.

3. Resources

Criterion 3.1 Staff and Staff Development

Evidence:

- Self-Assessment Report
- Staff Handbook
- Study plans
- Module descriptions

Discussions during the audit Preliminary assessment and analysis of the experts:
According to the self-assessment report, there are 25 members of staff involved in the teaching of the two programmes under review (2 professors, 6 associate professors, 9 assistant professors, 4 lecturers, 1 research fellow and 3 laboratory assistants).

The policies and procedures for the recruitment and retention of suitably qualified staff are contained in the Human Resources Policies and Procedures Handbook. In addition, the recruitment procedure for academic staff is set out in the Academic Staff Regulations. The first step in the procedure is the nomination of a faculty member by the department, which is submitted to the College Council and then to the Appointments and Promotions Committee. After the latter has approved the decision, the nomination is forwarded to the University Council for final approval, after which an offer of appointment is made. New faculty members are initially instructed and guided by the Directorate of Human Resources and the Dean. The Head of Department mentors new academics during the first semester to ensure that teaching policies and procedures are followed and to provide support for development.

During the audit, teachers explain that typically regular teachers are responsible for four to five courses per semester, heads of department for up to two courses and deans also for two courses per semester. A PhD student usually teaches three courses to allow sufficient time for research and publication. In general, the teaching load depends on the faculty member's specific position and the extent of their additional responsibilities; the more administrative tasks a faculty member has to fulfil, the more their teaching load will be reduced.

In addition, the experts learn during the review that, due to the relatively small size of the cohorts, the student/staff ratio is moderate at 1:8. This means that on average there are between 15 and 18 students per course.

In terms of non-technical staff, Ahlia University has a variety of organisational structures for advising, monitoring and supporting students. For example, a special committee within the Student Guidance and Counselling Team ensures that arrangements are made for students with special needs and coordinates with faculty members any adjustments needed to facilitate student learning. The Deanery of Student Affairs provides support for students in a variety of areas, including support for students before and during the examination period. They also offer various workshops to help students manage stress and maintain their mental health and well-being. Students indicate in the audit that they are very satisfied with both academic and non-academic staff and feel very well supported throughout their studies. The reviewers are also impressed by the commitment of university staff and the services that have been put in place to support each student in the best way possible. With

regard to the academic staff, the experts confirm that the composition, academic orientation and qualifications of the teaching staff are adequate for the successful implementation and continuation of the two programmes.

Staff Development

Ahlia University actively encourages and supports its members to pursue further development and academic advancement and has therefore established various policies. The formal basis for promotion and development initiatives is defined in the Academic Staff Bylaws for Academic Promotion and the Professional Development Plan, which is revised annually. Another tool for motivating staff members is the regular performance assessment through the overall faculty evaluation for academic staff. According to the self-evaluation report, in the last five years several faculty members have been promoted from lecturer to assistant professor and one from assistant professor to associate professor. In addition, over the past five years, the College has funded the Ph.D. of one of its members in collaboration with Brunel University in London. In addition, the Professional Development Committee organises regular workshops open to all academic members of Ahlia University.

The University also has a central research plan, which is revised every four years, to encourage and support the research activities of its academic staff. This includes participation in research symposia, guest lectures and seminars, publishing in international and local journals, publishing books and presenting papers at international conferences. As part of the support system, Ahlia University offers financial support in these areas and (monetary) awards for special achievements. The university also conducts regular surveys to assess the feedback of its academic staff.

The experts find that Ahlia University has an excellent support system for the development of its teachers. In the audit, the group of experts inquires about the time that teachers actually invest in research and development. The faculty members state that everyone is actively involved in research, which is also reflected in the high number of publications in the faculty. Last year, for example, all academic staff at the university together published more than 1000 papers in Scopus. Teachers praise the support systems for academic staff, which offer many opportunities for development. They also appreciate the healthy competition among colleagues and the familial atmosphere at the university, which allows them to grow professionally and personally. The experts are pleased to hear that teachers are well supported, which also ensures that the high quality of teaching in the two programmes under review is maintained.

Criterion 3.2 Funds and equipment

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the experts:

According to the self-assessment report, the college has 24 classrooms with computers equipped with relevant software such as Microsoft Office. The lecture halls can accommodate between 20 and 35 students and are equipped with both smart boards and white boards. The university also has a theatre for large events with a capacity of up to 84 students and a seminar room normally used for research-related activities, including research defence, with a capacity of 39 students. In addition, the University has 12 designated computer laboratories equipped with the latest hardware and software. Engineering students have access to a dedicated research computer lab. In addition, there are three specific engineering laboratories equipped with engineering-related software and practical kits. At the beginning of each semester, members of the ICT Centre inspect all learning facilities and equipment to ensure that everything is well maintained, and carry out replacements or upgrades where necessary.

Ahlia University students also have access to the University Library. The library has several study areas for students and staff. In addition to print media, the library provides access to a variety of electronic media. In total, according to the university, the library offers access to more than 2,500,000 e-journal reference materials through 46 databases, including EBSCO, Proquest, IEEE and many others.

Students report being very satisfied with the facilities and equipment at Ahlia University, noting that all the necessary tools and software are available. Teachers are likewise content with the labs and facilities, mentioning that the resources allow them to conduct both teaching and research at a high level.

During the audit, the experts visit the facilities and laboratories on the campus. They find that the infrastructure is well maintained and adequate to run the two programmes under review and to meet the programme objectives. They also learn that a new, larger campus is currently under construction and is expected to be completed in 2025. They believe that the new campus will provide students and staff with even better conditions for studying and working. In addition, the experts believe that there is secure funding and reliable financial planning to ensure that the two programmes run at the same level for the next five years.

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

The experts find that the criterion is fully met.

4. Transparency and Documentation

Criterion 4.1 Module Descriptions

Evidence:

- Self-Assessment Report
- Module descriptions
- Websites of all study programmes

Preliminary assessment and analysis of the experts:

After studying the module descriptions the experts confirm that they include all necessary information (course name, course code, students' total workload, awarded ECTS points, grading scale, intended learning outcomes, content, recommended literature, possible pre-requisites, name of teacher/teachers in charge, exam methods, and assessment criteria). 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.

However, the experts note that the module descriptions are currently contained in separate syllabi, with each syllabus being a separate file. The Course Catalogue, which is also available online, provides students with an overview of all modules in one document. However, the list contains only a very brief description of the course content and credits. The experts therefore suggest that all syllabi, including the detailed content of each module, should be compiled in one document.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Exemplary diploma certificate per study programme
- Exemplary transcript per study programme

Preliminary assessment and analysis of the experts:

The experts confirm that students of the two programmes receive a Diploma/Certificate and a Transcript of Records on graduation. The transcript includes a list of all the modules completed and the grades received for each module. However, Ahlia University does not

currently issue a Diploma Supplement to its graduates. The experts therefore insist that all graduates of the two programmes studied receive a diploma supplement containing information on the student's qualification file (i.e. the learning outcomes achieved), the final grade and a classification of the final grade. The contextualization should include statistical data on the final results of other students in the cohort. In addition, the Diploma Supplement must include a classification of the programme within the education system in Bahrain.

Criterion 4.3 Relevant Rules

Evidence:

- Self-Assessment Report
- All relevant regulations as published on the university's webpage
- Audit Discussions

Preliminary assessment and analysis of the experts:
The auditors confirm that the rights and duties of both Ahlia University and the students are clearly defined and binding. All rules and regulations are published on the university's website and the students receive the course material at the beginning of each semester.

In addition, all relevant information about the degree programmes (e.g., module handbook, study plan, intended learning outcomes) is available on the homepage of the programmes.

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

The experts welcome the fact that Ahlia University provides a sample Diploma Supplement for each programme under review. They note that the Diploma Supplement largely complies with the ASIIN criteria. However, some information is missing. These include the intended learning outcomes of the programme (so that future employers and other interested parties can assess the qualification profile of the graduate), the final grade and statistics on cohort performance according to the ECTS User's Guide, which contextualise the student's final grade.

5. Quality management: quality assessment and development

Criterion 5 Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- QA Manual
- Samples of surveys for students, teachers and industry partners
- Reports of the survey results
- Benchmarking Reports
- Discussions during the audit
- Student Handbook

Preliminary assessment and analysis of the experts:
The central body responsible for quality assurance at Ahlia University is the Centre for Accreditation and Quality Assurance (CAQA). CAQA's responsibilities include coordinating all internal and external quality assurance activities, such as organising internal reviews and monitoring the extent to which the policies and procedures established by Ahlia University are implemented. All guidelines, policies and tasks related to quality assurance are defined in the QA Manual. CAQA summarises its findings in reports which are submitted to the Teaching, Learning and Assessment Committee (TLAC) and the Accreditation and Quality Assurance Committee (AQAC). Both committees monitor and oversee academic and administrative operations. Specific quality assurance policies are communicated to and implemented by the Departmental Councils and the College Council. For example, each semester the Departmental Councils implement the "Programme Review End of Semester Report", which provides an overall status of a programme and assesses its compliance with QA standards. The report is in turn submitted to College Council for review and decision.

In addition to the end-of-semester programme review, there is an annual review of each programme at Ahlia University. The annual review is also carried out by the Departmental Council and forwarded to the College Council and then to the Curriculum Committee. The purpose of the annual review is to provide an overview of the status of a programme and to make minor changes if necessary.

A further programme review is carried out on a 3-year cycle. Compared to the annual review, this review is much more comprehensive and detailed and includes feedback from

stakeholders and other external members. Input is gathered mainly at three levels: stakeholder surveys, external evaluator assessments and benchmarking studies.

Ahlia University collects feedback from all stakeholders including students, alumni, industry partners and employers of graduates through surveys. The surveys are conducted and analysed by the Centre for Measurement and Evaluation (CME). The results are reported to the Faculty and College Councils for review and decision making. For example, student surveys over the past few years have revealed the students' desire for professional certification, which led to the establishment of the "HUAWEI Academy for Cloud Computing" course in the Computer and Communication Engineering programme. Ahlia University conducts various student surveys, including the Student Satisfaction Survey, the Exit Survey, the Special Needs Student Survey and the Course Evaluation Survey. The latter is conducted online at the end of each semester. According to the Student Handbook, course evaluations "measure student satisfaction with the course, its structure, the instructor, and the instructor's availability and means of communication". Students also have the option of submitting their feedback to the student representative on the College Council or to the lecturer directly. In addition to students, alumni and industry partners are also surveyed each semester for their feedback on the programme. During the audit, industry partners inform the experts that there are also advisory boards consisting of industry advisors who meet once a quarter. The minutes of these meetings are forwarded to the respective departmental council and the College Council.

Ahlia University also receives regular external feedback using the University Guidelines for External Evaluation of Academic Programmes. This includes (international) accreditation of the programmes by different agencies. Benchmarking is another widely used mechanism at Ahlia University. The Department of Computer Engineering for example found that there are four similar programmes offered in the UK (Leeds University), Germany (University of Duisburg-Essen), Lebanon (American University of Beirut's) and Bahrain (University of Bahrain). In the case of the Mobile and Network Engineering programme, the Department of Telecommunications Engineering found that the programme was similar to those at Bedfordshire University (UK) and Iqra University (Pakistan). The results of the benchmarking are used to improve the academic programmes and keep them in line with international standards and market requirements.

After gathering feedback from all QA mechanisms, departments document their findings and proposed revisions to programmes, which are then incorporated into the annual operating plan.

During the audit, students confirmed that surveys are carried out regularly and that the results of the evaluation are communicated to them shortly afterwards. They state that

their feedback is taken into account by the departmental councils and that improvements are usually implemented quickly. Students praise the familial atmosphere at the university, which welcomes suggestions for development and encourages students to give feedback both through surveys and directly to teachers.

Industry partners in the audit report that they are also satisfied with the quality of the programmes, the graduates of the two programmes under review and the quality assurance procedures. Ahlia University regularly consults them for feedback and implements their suggestions.

After reviewing the documentation and conducting the audit interviews, the experts are very impressed with the extensive quality assurance mechanisms in place at Ahlia University. Programmes are regularly reviewed, taking into account feedback from all stakeholders and external evaluators. The results of these processes are communicated to students and used for continuous programme development. Furthermore, processes and responsibilities are defined transparently for all stakeholders. The experts also appreciate the friendly atmosphere between all members of the university and the positive feedback culture. In conclusion, the experts are convinced that the quality assurance system in place ensures that the two programmes under review are maintained at a high level.

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

The experts conclude that the criterion is entirely 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:

SM Number	Evidence Name	Document
SM100	the update BSMNE study Plan	BSMNE - ASIIN proposed Study Plan
SM101	ECTE 317 Cloud computing Syllabus/ scorecard	Mobile Computing Course Syllabus.doc Mobile Computing Mapping Scorecard.
SM102	ECTE 415 Network Management and Administration	ECTE 415 Mapping Scorecard.docx ECTE 415 Syllabus Sepcification.docx
SM103	the update BSCCE study Plan	BSCCE Study Plan Version 2024 - ASIIN
SM104	Instership scorecard INTR 461	INTR 461 Mapping Scorecard- V.6 .docx
SM105	Instership scorecard INTR 462	INTR 462 Mapping Scorecard- 2024.doc
SM106	NQF handbook	NQF Handbook 2023 Edition (EN).pd

SM107	ECCE Course handbook	ECCE Course Syllabi.pdf
SM108	ECTE course handbook	ECTE Courses Syllabi.pdf
SM109	BSCCE diploma supplement	Bachelor's degree in computer and co
SM110	BSMNE diploma supplement	Bachelor's degree in mobile and netw

E Comment of the Higher Education Institution (27.05.2024)

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

ASIIN experts recommendation	**CE Ahlia university action**
Criterion 1.2 Name of the Degree Programme	
The experts suggest that if the title Mobile and Network Engineering is to be retained, the modules "Electronic Circuits" and "Computer Architecture and Organisation" could be removed from the programme (or alternatively offered as electives), as they do not provide a clear benefit to Mobile and Network Engineering education, and instead be replaced with more core modules in the field of Mobile and Network Engineering Technology.	As the response to the experts' recommendations, we have replaced the "Computer Architecture (ECCE 303)" course with "Mobile Computing (ECTE 317)" and the "Wireless Communication" course with "Network Management and Administration. (ECTE 415)" This update to the BSMNE study plan enhances the focus on mobile and network engineering, providing more comprehensive coverage of these fields. The study plan will be effective from first semester 24-25 According to the recommendations of experts, we divide the major elective courses into two pools. Each student should take two courses from each pool. The first pool consists of core course electives that are directly related to the depth of the mobile and network field, as shown below. The second pool is considered as extra courses in a breadth field. **(Ref SM 100, SM 101, SM 102)**
however, the experts consider that the total number of core courses is still somewhat low and recommend increasing the number of core/mandatory courses that deal with Computer and Communication Engineering. In addition, the experts believe that the electives do not include enough courses in the area of computing and communications, and therefore recommend that the electives should have a stronger focus in this	According to the recommendations of experts, we divide the major elective courses into two pools. Each student should take two courses from each pool. The first pool consists of core course electives that are directly related to the depth of the computer and communication field, as shown below. The second pool is considered as extra courses in a breadth field. **(Ref SM 103)**

area. This is discussed in more detail in Chapter 1.3.	
Criterion 1.3 Curriculum	
However, they note a miscalculation in the number of credits awarded to the internship, as the internship has a workload of 240 hours but is only awarded 3 Bahraini credits or 5 ECTS credits. This is discussed in more detail in chapter 1.5.	The internship course was revised, and the workload is 180 hours. Attached are the syllabus and scorecard. According to the NQF handbook, the calculation is 3 USC (Bahrain credits) equal to 6 ECTS credits, with 6 * 30 = 180 hours. **(Ref SM 104, SM 105)**
Criterion 1.5 Workload and Credits	
After reviewing the documentation, the experts consider that the internal calculation of workload is generally correct and includes contact hours as well as self-study time. However, they note that the conversion from Bahrain Credits to ECTS is inaccurate. The university states in the self-evaluation report that 1 BC is approximately equivalent to 1.791 ECTS. However, if 1 BC equals 40 hours and 1 ECTS equals 30 hours, the correct coefficient between Bahrain Credits and ECTS points is approximately 1BC=1,333 ECTS. This can also be seen from the module descriptions: a module with 3 BC has a total workload of 120 hours: 120 divided by 30 (h) equals 4 ECTS. However, according to the university's conversion rate, each course should be awarded 5.37 ECTS (3 x 1.791). Therefore, the experts re-	The BSCCE and BSMNE programs were evaluated twice under the NQF framework, with the latest update in 2023. https://www.bqa.gov.bh/En/Reports/UniReports/HigherEducationReport/7%20APR%20-%20AU%20-%20BSCCE%20-%20EN.pdf https://www.bqa.gov.bh/En/Reports/UniReports/Pages/NewReport.aspx According to the regulatory guidelines of the HEC, 1 US credit (Bahrain credit) is equivalent to 2 ECTS credits. Based on these rules, our 134 US credits (Bahrain credits) will convert to 264 ECTS credits. Additionally, we have 4 mandatory courses as required by the regulations: 1- Composition for Native Speakers of Arabic I (ARAB 101) 2- Principles of Human Rights (HUMR 101) 3- Modern History of Bahrain (HIST 121) 4- Introduction to Computers & IT (ITCS 101)

quire the university to convert Bahrain Credits into ECTS correctly. Another problem that arises is that each programme under review does not accumulate to 240 ETCS as stated by the university, but to approximately 178.67 ECTS. However, the ASIIN criterion requires that Bachelor's students must have earned at least 180 ECTS credits by the time they graduate. The university must therefore ensure that each of the Bachelor's programmes under review has a total of at least 180 ECTS points.	The NQF considers a standard academic year to involve 1,200 notional learning hours, or 120 NQF Credits, a ratio of 10:1. The NQF does not allow the use of fractions in the calculated credits; fraction credit hours are rounded to the nearest whole credit. Other credit systems may already be in use in the Kingdom of Bahrain (notable examples including the American Credit System (ACS) and the European Credit Transfer System (ECTS)), and with a view to ensuring consistency and transparency a number of conversion mechanisms[2] have already been agreed on for use with the NQF. **Table** 5 describes the approximate conversion mechanisms. **Table 5. Approximate Conversion Mechanism to Convert ACS and ECTS to NQF Credit** American Credit System (ACS): To convert AC to NQF credit multiply the number of AC credit hours by 4. European Credit Transfer System (ECTS): To convert ECTS to NQF credit multiply the number of ECTS credits by 2. **(Ref SM 106)**
Criterion 4.1 Module Descriptions	
The experts therefore suggest that all syllabi, including the detailed content of each module, should be compiled in one document.	Our course handbook has been expanded to include the entire course syllabus in addition to the course descriptions, all within one document (attached). This comprehensive handbook is also published on the website. **(Ref SM 107, SM 108)**
Criterion 4.2 Diploma and Diploma Supplement	
However, Ahlia University does not currently issue a Diploma Supplement to its graduates. The experts therefore insist that all graduates of the two programmes studied receive a diploma supplement containing information on the student's qualification	Based on the regulations of ASIIN and European accreditation standards, a diploma supplement has been generated and integrated into our LMS system (ADREG). Attached are samples of the diploma supplement. **(Ref SM 109, SM 110)**

F Summary: Expert recommendations (31.05.2024)

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation*
Ba Mobile & Network Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029
Ba Computer & Communication Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029

*Subject to the approval of the ENAEE Administrative Council

Requirements

For all degree programmes

A 1. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

A 2. (ASIIN 1.5) Ensure that the credits awarded for the internship correspond with the actual workload of the students

A 3. (ASIIN 4.2) Ahlia University must provide every graduate with a Diploma Supplement that is in line with ASIIN criteria.

Recommendations

For the Bachelor's degree programme Computer and Communication Engineering

E 1. (ASIIN 1.3) It is recommended adding more core modules that reflect the focus of the study programme.

G Comment of the Technical Committees

Technical Committee 02 – Electrical Engineering/Information Technology (05.06.2024)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the decision of the experts without any changes.

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

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 02 – Electrical Engineering/Information Technology.

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

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation***
Ba Mobile & Network Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029
Ba Computer & Communication Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029

*Subject to the approval of the ENAEE Administrative Council

Technical Committee 04 – Informatics/Computer Science (14.06.2024)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the decision of the experts without any changes.

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

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation***
Ba Mobile & Network Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029
Ba Computer & Communication Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029

*Subject to the approval of the ENAEE Administrative Council

H Decision of the Accreditation Commission (28.06.2024)

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

The commission discusses the procedure and follows the decision of the experts and the Technical 'Committees without any changes.

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

The Accreditation Commission deems that the intended learning outcomes of the degree programmes do comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 02 – Electrical Engineering/Information Technology.

The Accreditation Commission decides to award the following seals:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation***
Ba Mobile & Network Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029
Ba Computer & Communication Engineering	With requirements for one year	30.09.2029	EUR-ACE®	30.09.2029

*Subject to the approval of the ENAEE Administrative Council

Requirements

For all degree programmes

A 1. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

A 2. (ASIIN 1.5) Ensure that the credits awarded for the internship correspond with the actual workload of the students

A 3. (ASIIN 4.2) Ahlia University must provide every graduate with a Diploma Supplement that is in line with ASIIN criteria.

Recommendations

For the Bachelor's degree programme Computer and Communication Engineering

E 1. (ASIIN 1.3) It is recommended adding more core modules that reflect the focus of the study programme.

A Fulfilment of Requirements (27.06.2025)

Analysis of the experts and the Technical Committees (05.06.2025)

Requirements

For all degree programmes

A 1. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

Initial Treatment	
Peers	fulfilled Justification: Regarding the calculation of workload and credit distribution, the HEI explains that workload is based on contact hours and self-study time. To assess the appropriateness of the workload for students, the College of Engineering has revised the student satisfaction survey to include a question about satisfaction with the overall workload. Recent surveys have shown that 91.2% of students are satisfied with the workload and the credits awarded. The experts appreciate the HEI's explanation and the fact that there are now precise surveys on the verification of the workload. Regarding the conversion from Bahrain credits (BC) to ECTS, the HEI refers to the NQF (National Qualification Framework) handbook, which defines the conversion as 1 BC to 2 ECTS. They agree that this conversion does not entirely align with ECTS norms, as 1 ECTS credit involves 25–30 hours, whereas the NQF guidelines calculate that 1 ECTS credit is equivalent to a workload of 22.8 hours. However, they emphasise that these are national regulations to which all universities in Bahrain, including Ahlia University, must adhere. The experts understand the restrictions imposed on the HEI by national regulations and therefore accept the deviation in the conversion from BC to ECTS.
TC 02	Fulfilled Justification: The TC follows the vote of the experts.
TC 04	Fulfilled.

	Justification: The TC discusses in detail how to deal with the underlying national regulation with regard to the ECTS definition and is in favour of the Accreditation Commission making a corresponding decision in principle. The TC recognises that the University uses a workload-based credit system and that a corresponding question was included in the student surveys. For these reasons, the TC agrees with the experts' assessment. Nevertheless, the TC is in favour of the Commission deciding how to deal with the present national regulation.
AC	fulfilled Justification: The Accreditation Commission discusses the procedure and acknowledges that the university is required to comply with national regulations. Nevertheless, it finds that when the HEI displays ECTS credits, these must align with the standards outlined in the ECTS User Guide, which is currently not the case. They conclude though that it is sufficient if the university uses and displays its own credit point system, as it is based on the students' workload. However, in this case, the degree certificates (including the Diploma Supplement) must specify how the local/Bahraini credit system is calculated—i.e., indicate the student workload that corresponds to one local credit point, as well as the total workload required for each degree programme. The Commission therefore considers this requirement to be fulfilled but requires that a comment be included in the decision letter to the HEI. This comment must state that the HEI must not use or display ECTS credits if they are applied incorrectly. Instead, the HEI must indicate the student workload (in hours) on which the Bahraini credit system is based, as well as the total workload for each degree programme, in the degree certificates.

A 2. (ASIIN 1.5) Ensure that the credits awarded for the internship correspond with the actual workload of the students.

Initial Treatment	
Peers	Fulfilled Justification: The workload of the Internship was adjusted and now is in line with the number of Bahrain Credits awarded.
TC 02	Fulfilled Justification: The TC follows the vote of the experts.
TC 04	Fulfilled.

	Justification: The TC follows the experts' assessment without any changes.
AC	fulfilled Justification: The AC follows the experts' assessment without any changes.

A 3. (ASIIN 4.2) Ahlia University must provide every graduate with a Diploma Supplement that is in line with ASIIN criteria.

Initial Treatment	
Peers	Fulfilled Justification: The HEI provides a revised sample of the Diploma Supplement, which contains all information required by ASIIN criteria.
TC 02	Fulfilled Justification: The TC follows the vote of the experts.
TC 04	Fulfilled. Justification: The TC follows the experts' assessment without any changes.
AC	fulfilled Justification: The AC follows the experts' assessment without any changes.

Decision of the Accreditation Commission (27.06.2025)

Degree programme	**ASIIN-label**	**Subject-specific label**	**Accreditation until max.**
Ba Mobile & Network Engineering	All requirements fulfilled	EUR-ACE®	30.09.2029
Ba Computer & Communication Engineering	All requirements fulfilled	EUR-ACE®	30.09.2029

The Accreditation Committee for Degree Programmes decides to include the following reference into the notifying letter to the HEI:

"To ensure transparent credit calculation and conversion, the HEI must indicate in the degree certificates, including the Diploma Supplement, the workload (in hours) on which Bahraini credits are based, as well as the total workload required for each degree programme."

Appendix: Programme Learning Outcomes and Curricula

According to the website, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Computer and Communication Engineering (BSCCE):

"**A. Knowledge and Understanding**

A1. Concepts and Theories
Demonstrate detailed knowledge and understanding of the concepts and required theories of mathematics, science, and engineering essential for a specialization in computer and communication engineering.

A2. Contemporary Trends, Problems and Research
Impart knowledge of established research methods in the field of computer and communication engineering to enable students to grapple with contemporary issues in the field.

A3. Professional Responsibility
Gain appreciation and insight into technical aspects in engaging in engineering practice as a computer and communication engineer.

B. Subject-Specific Skills

B1. Problem solving
Demonstrate creativity in solving quantitatively engineering problems germane to computer and communication engineering.

B2. Modelling and Designing
Conduct engineering experiments in computer and communication system to meet desired needs within realistic engineering constraints using various concept.

B3. Application of Methods and Tools
Use specialized level of modern engineering tools necessary for engineering practice and experiments in computer and communication engineering.

C. Critical Thinking Skills

C1. Analytic
Use range of approaches to analyze specific computer communication engineering solutions with a view to practical implementation in computer and communication engineering.

C2. Synthetic
Integrate information and concepts within the common understanding of computer and communication engineering to generate cogent conclusions with respect to theoretical and practical issues encountered in computer and communication engineering.

C3. Creative
Demonstrate insight and innovative techniques in solving specific computer communication engineering problems in complex quantitative solutions.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication
Operate at specialized level of skills to communicate ideas to make formal presentations on special topics in the field of computer and communication engineering.

D2. Teamwork and Leadership
Operate with significant responsibility as a member of a team on specialized topics, often involving experimentation in computer and communication engineering.

D3. Organizational and Developmental skills
Demonstrate ability to engage in scientific life-long learning to hone professional and organizational skills.

D4. Ethics and social responsibility
Gain insight into ethical dimensions of engineering and the role of the engineer as a positive agent of societal improvement in socioeconomic contexts at the local, regional and international level."

The following **curriculum** is presented:

BSCCE 22-23 - FIRST YEAR (35 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ARAB	101	Composition for Native Speakers of Arabic I	3	0	3	
ENGL	101	Academic English I	3	0	3	ENGL 052 AND ENGL 055 or passing placement test
ITCS	101	Introduction to Computers & IT	2	2	3	
MATH	101	Calculus I	3	0	3	MATH 053 or passing placement test
PHYS	101	General Physics I	3	0	3	MATH 053 or passing placement test
STAT	101	Introduction to Statistics	3	0	3	MATH 053 or passing placement test
					18	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ENGL	102	Academic English II	3	0	3	ENGL 101
HIST	121	Modern History of Bahrain	3	0	3	
ITCS	122	Introduction to Programming Techniques	2	2	3	ITCS 101
MATH	102	Calculus II	3	0	3	MATH 101
PHYS	102	Physics II	2	2	3	PHYS 101
HUMR	101	Principles of Human Rights	2	0	2	
					17	

BSCCE 22-23 - SECOND YEAR (33 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	201	Electric Circuits	2	2	3	PHYS 102 AND MATH 102
ITCS	209	Discrete Structures	3	0	3	MATH 101
MATH	205	Differential Equations	3	0	3	MATH 102
ITCS	201	Object-Oriented Programming I	2	2	3	ITCS 122
ENGL	201	Academic English III	3	0	3	ENGL 102
					15	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	221	Electronic Circuits	2	2	3	ECCE 201
ITCS	224	Data Structures	2	2	3	ITCS 201
ECCE	203	Digital Logic	2	2	3	ITCS 101
ECTE	224	Signals & Systems	2	2	3	MATH 205
MATH	223	Linear Algebra and Complex Analysis	3	0	3	MATH 101
ENGL	210	Technical Report Writing	3	0	3	ENGL 201
					18	

BSCCE 22-23 - THIRD YEAR (36 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	303	Computer Architecture and Organization	2	2	3	ECCE 203
ITCS	323	Database Systems: Design and Application	2	2	3	ITCS 224
ECTE	314	Communication Systems I	2	2	3	ECTE 224 AND ECCE 221
ECCE	326	Digital Logic Design	2	2	3	ECCE 203
ECTE	329	Computer Networks	2	2	3	ECCE 203
					15	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	323	Microprocessors	2	2	3	ECCE 303
HU/SS	XXX	Humanities/Social Sciences	3	0	3	
ETHC	392	Ethics and Professional Practice in IT and Engineering	3	0	3	Completion of at least 66 credits
ECTE	324	Communication Systems II	2	2	3	ECTE 314
STAT	302	Applied Probability	3	0	3	STAT 101 AND MATH 102
ECTE	322	Antenna and Wave Propagation	2	2	3	MATH 205 AND MATH 223
					18	

Summer Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
INTR	461	BSCCE Internship	0	0	3	Completion of at least 90 credits And Minimum CGPA 2
					3	

BSCCE 22-23 - FOURTH YEAR (30 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	403	Embedded Systems	2	2	3	ECCE 323
ECTE	450	Digital Signal Processing	2	2	3	ECTE 224
IERM	498	Research Methods in Information Technology & Engineering	3	0	3	Completion of at least 90 credits
XXXX	XXX	Major Elective I	X	X	3	
XXXX	XXX	Major Elective II	X	X	3	
					15	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ITCS	409	Operating Systems	3	0	3	ECCE 303
ECCE	499	Major Project	0	6	3	IERM 498 AND ETHC 392
ECTE	424	Wireless Communications	2	2	3	ECTE 324 AND ECTE 322
XXXX	XXX	Major Elective III	X	X	3	
XXXX	XXX	Major Elective IV	X	X	3	
					15	

LIST OF MAJOR ELECTIVE COURSES

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	324	Principles of Control Systems	2	2	3	ECTE 224 AND MATH 205
ECCE	413	Internet of Things	2	2	3	ECCE 303 AND ECTE 329
ECCE	424	Cyber Security	2	2	3	STAT 302
ECCE	425	Engineering Management	3	0	3	Completion of at least 90 credits
ECCE	443	Applied Robotics	2	2	3	ECCE 323
ECCE	451	Machine Learning	2	2	3	STAT 302 AND MATH 205
ECCE	452	Computer Vision	2	2	3	ITCS 224
ECTE	406	Multimedia Communications	2	2	3	ECTE 450
ECTE	474	Optical Communications	2	2	3	ECTE 324
ITMS	437	Cloud Services Development	2	2	3	ITCS 323

According to the website, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Mobile and Network Engineering (BSMNE):

"A. Knowledge and Understanding

A1. Concepts and Theories

Demonstrate detailed knowledge and understanding of the concepts and required theories of mathematics, science, and engineering essential for a specialization in mobile and network engineering.

A2. Contemporary Trends, Problems and Research

Impart knowledge of established research methods in the field of mobile and network engineering to enable students to grapple with contemporary issues in the field.

A3. Professional Responsibility

Gain appreciation of and insight into technical aspects in engaging in engineering practice as a mobile and network engineering.

B. Subject-Specific Skills

B1. Problem solving

Demonstrate creativity in solving engineering problems germane to mobile and network engineering.

B2. Modelling and Designing

Conduct engineering experiments in mobile and network system to meet desired needs within realistic engineering constraints using various concept.

B3. Application of Methods and Tools

Use specialized level of modern engineering tools necessary for engineering practice and experiments in mobile and network engineering.

C. Critical Thinking Skills

C1. Analytic
Use range of approaches to analyze specific mobile and network engineering solutions with a view to practical implementation in computer and communication engineering.

C2. Synthetic
Integrate information and concepts within the common understanding of mobile and network engineering to generate cogent conclusions with respect to theoretical and practical issues encountered in mobile and network engineering.

C3. Creative
Demonstrate insight and innovative techniques in solving specific mobile and network engineering problems in complex solutions.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication
Operate at specialized level of skills to communicate ideas to make formal presentations on special topics in the field of mobile and network engineering.

D2. Teamwork and Leadership
Operate with significant responsibility as a member of a team on specialized topics, often involving experimentation in mobile and network engineering.

D3. Organizational and Developmental skills
Demonstrate ability to engage in scientific life-long learning to hone professional and organizational skills.

D4. Ethics and social responsibility
Gain insight into ethical dimensions of engineering and the role of the engineer as a positive agent of societal improvement in socioeconomic contexts at the local, regional, and international level.“

The following **curriculum** is presented:

BSMNE 22-23 - FIRST YEAR (35 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ARAB	101	Composition for Native Speakers of Arabic I	3	0	3	
ENGL	101	Academic English I	3	0	3	ENGL 052 AND ENGL 055 or passing placement test
ITCS	101	Introduction to Computers & IT	2	2	3	
MATH	101	Calculus I	3	0	3	MATH 053 or passing placement test
PHYS	101	General Physics I	3	0	3	MATH 053 or passing placement test
STAT	101	Introduction to Statistics	3	0	3	MATH 053 or passing placement test
					18	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ENGL	102	Academic English II	3	0	3	ENGL 101
HIST	121	Modern History of Bahrain	3	0	3	
ITCS	122	Introduction to Programming Techniques	2	2	3	ITCS 101
MATH	102	Calculus II	3	0	3	MATH 101
PHYS	102	Physics II	2	2	3	PHYS 101
HUMR	101	Principles of Human Rights	2	0	2	
					17	

BSMNE 22-23 - SECOND YEAR (33 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	201	Electric Circuits	2	2	3	PHYS 102 AND MATH 102
ITCS	209	Discrete Structures	3	0	3	MATH 101
MATH	205	Differential Equations	3	0	3	MATH 102
ITCS	201	Object-Oriented Programming I	2	2	3	ITCS 122
ENGL	201	Academic English III	3	0	3	ENGL 102
					15	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	221	Electronic Circuits	2	2	3	ECCE 201
ITCS	224	Data Structures	2	2	3	ITCS 201
ECTE	224	Signals & Systems	2	2	3	MATH 205
ECCE	203	Digital Logic	2	2	3	ITCS 101
MATH	223	Linear Algebra and Complex Analysis	3	0	3	MATH 101
ENGL	210	Technical Report Writing	3	0	3	ENGL 201
					18	

BSMNE 22-23 - THIRD YEAR (36 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	303	Computer Architecture and Organization	2	2	3	ECCE 203
ECTE	314	Communication Systems I	2	2	3	ECTE 224 AND ECCE 221
ITCS	323	Database Systems: Design and Application	2	2	3	ITCS 224
ECTE	328	Mobile Application Development	2	2	3	ITCS 201 AND ITCS 224
STAT	302	Applied Probability	3	0	3	STAT 101 AND MATH 102
ECTE	329	Computer Networks	2	2	3	ECCE 203
					18	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECTE	324	Communication Systems II	2	2	3	ECTE 314
ECTE	322	Antenna and Wave Propagation	2	2	3	MATH 205 AND MATH 223
ECTE	349	Network Routing & Switching	2	2	3	ECTE 329
ETHC	392	Ethics and Professional Practice in IT and Engineering	3	0	3	Completion of at least 66 credits
HU/SS	XXX	Humanities/Social Sciences	3	0	3	
					15	

Summer Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
INTR	462	BSMNE Internship	0	0	3	Completion of at least 90 credits And Minimum CGPA 2
					3	

BSMNE 22-23 - FOURTH YEAR (30 CREDITS)

First Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECTE	421	Network Design & Security	2	2	3	ECTE 349
ECTE	450	Digital Signal Processing	2	2	3	ECTE 224
IERM	498	Research Methods in Information Technology & Engineering	3	0	3	Completion of at least 90 credits
XXXX	XXX	Major Elective I	X	X	3	
XXXX	XXX	Major Elective II	X	X	3	
					15	

Second Semester

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECTE	406	Multimedia Communications	2	2	3	ECTE 450
ECTE	424	Wireless Communications	2	2	3	ECTE 324 AND ECTE 322
ECTE	499	Major Project	0	6	3	IERM 498 AND ETHC 392
XXXX	XXX	Major Elective III	X	X	3	
XXXX	XXX	Major Elective IV	X	X	3	
					15	

LIST OF MAJOR ELECTIVE COURSES

Course	Code	Course Title	Lec	Lab	Cr	Prerequisite
ECCE	413	Internet of Things	2	2	3	ECCE 303 AND ECTE 329
ECCE	424	Cyber Security	2	2	3	STAT 302
ECCE	425	Engineering Management	3	0	3	Completion of at least 90 credits
ECTE	414	WAN Technology	2	2	3	ECTE 329
ECTE	454	Satellite and Space Communications	2	2	3	ECTE 322
ECTE	472	Software-Defined Radio	2	2	3	ECTE 324
ECTE	474	Optical Communications	2	2	3	ECTE 324
ITCS	409	Operating Systems	3	0	3	ECCE 303
ITCS	422	Distributed Systems	2	2	3	ITCS 409
ITMS	437	Cloud Services Development	2	2	3	ITCS 323