ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Biology
Chemical Bacteriology and Parasitology
Food Science
Genomic Biotechnology

Provided by
Universidad Autónoma de Nuevo León

Version: March 29th 2019

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Licenciado en Biólogo	Bachelor Degree in Biology	ASIIN	-	10
Licenciado como Químico Bacteriólogo Parasitólogo	Bachelor Degree in Chemical Bacteriology and Parasitology	ASIIN	-	09, 10
Licenciado en Ciencia de Alimentos	Bachelor Degree in Food Science	ASIIN	-	08, 10
Licenciado en Biotecnología Genómica	Bachelor Degree in Genomic Biotechnology	ASIIN	-	10
Date of the contract: 27.10.2016 **Submission of the final version of the self-assessment report:** 10.02.2017 **Date of the onsite visit:** 09.05. – 11.05.2017 **at:** San Nicolás de los Garza, Nuevo León, México				
Peer panel: Prof. Dr. Ronald Ebbert, University of Applied Sciences Nuernberg Prof. Dr. Dr. Oliver Müller, University of Applied Sciences Kaiserslautern Prof. Dr. Hans-Jörg Jacobsen, University Hannover Dr. Thomas Meier, Roche Diagnostics GmbH Brenda Susana Luna-Flores, Universidad Autónoma de Ciudad Juárez, México				
Representative of the ASIIN headquarter:				

[1] ASIIN Seal for degree programmes;

[2] TC: Technical Committee for the following subject areas: TC 08 – Agronomy, Nutritional Sciences and Landscape Architecture; TC 09 – Chemistry; TC 10 – Life Sciences;

Rainer Arnold	
Responsible decision-making committee: Accreditation Commission for Degree Programmes	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2014 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 09.12.2011	

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 Biology	Licenciado/B.Sc.	-	6	Full time	no	10 Semester	220 ECTS	Spring + Fall/2013
Ba Chemical Bacteriology and Parasitology	Licenciado/B.Sc.	-	6	Full time	no	10 Semester	220 ECTS	Spring + Fall/2013
Ba Food Science	Licenciado/B.Sc.	-	6	Full time	no	10 Semester	220 ECTS	Spring + Fall/2013
Ba Genomic Biotechnology	Licenciado/B.Sc.	-	6	Full time	no	10 Semester	220 ECTS	Spring + Fall/2013

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

For the Bachelor's degree programme Biology UANL has presented the following profile in the Self-Assessment Report:

„The Biology Programme has been structured to address three main "pillars" which are: flexibility, innovation and internationalization. The Programme was designed to comprise a period of five years (Ten semesters) to accomplish educational objectives of full time students. During this time, students gain experience in the previously discussed curricular areas such as the basic sciences, contemporary biology, biodiversity and environmental sciences. The Programme considers a holistic learning experience such that it encompasses Laboratory work, social service, thesis, student exchange, internships and extracurricular activities. In addition to their core courses and in order to integrate the learning processes and student outcomes, a series of professional electives courses are offered."

For the Bachelor's degree programme Chemical Bacteriology and Parasitology UANL has presented the following profile in the Self-Assessment Report:

„The Chemical Bacteriology and Parasitology Programme has been structured to address three main "pillars" which are: flexibility, innovation and internationalization. The Programme was designed to comprise a period of five years (Ten semesters) to accomplish educational objectives of full time students. During this time, students gain experience in the previously discussed curricular areas such as the basic sciences, biology, chemistry, microbiology, parasitology and biotechnology. The Programme considers a holistic learning experience such that it encompasses Laboratory work, social service, thesis, student exchange, internships and extracurricular activities. In addition to their core courses and in order to integrate the learning processes and student outcomes, a series of professional electives courses are offered."

For the Bachelor's degree programme Food Science UANL has presented the following profile in the Self-Assessment Report:

"The Food Science Programme has been structured to address three main "pillars" which are: flexibility, innovation and internationalization. The Programme was designed to comprise a period of five years (Ten semesters) to accomplish educational objectives of full time students. During this time, students gain experience in the previously discussed curricular areas such as the basic sciences, biology, chemistry, physical-mathematical, microbiology, and food science and technology. The Programme considers a holistic learning experience such that it encompasses Laboratory work, social service, thesis, student exchange, internships and extracurricular activities. In addition to their core courses and in order to integrate the learning processes and student outcomes, a series of professional electives courses are offered."

For the Bachelor's degree programme Genomic Biotechnology UANL has presented the following profile in the Self-Assessment Report:

"The Genomic Biotechnology Programme has been structured to address three main "pillars" which are: flexibility, innovation and internationalization. The Programme was designed to comprise a period of five years (Ten semesters) to accomplish educational objectives of full time students. During this time, students gain experience in the previously discussed curricular areas such as the basic sciences, genomic sciences, bioinformatics and biotechnology. The Programme considers a holistic learning experience such that it encompasses Laboratory work, social service, thesis, student exchange, internships and extracurricular activities. In addition to their core courses and in order to integrate the learning processes and student outcomes, a series of professional electives courses are offered."

C Peer Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Competence-Module-Matrix
- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Webpage Ba Biology http://www.uanl.mx/content/biologo-x (access 17.05.2017)
- Webpage Ba Chemical Bacteriology and Parasitology http://www.uanl.mx/oferta/quimico-bacteriologo-parasitologo-x.html (access 17.05.2017)
- Webpage Ba Food Science http://www.uanl.mx/oferta/licenciatura-en-ciencia-de-alimentos-x.html (access 17.05.2017)
- Webpage Ba Genomic Biotechnology http://www.uanl.mx/oferta/licenciatura-en-biotecnologia-genomica-x.html (access 17.05.2017)

Preliminary assessment and analysis of the peers:

The peers refer to the Subject-Specific Criteria (SSC) of the Technical Committee Life Sciences as a basis for judging whether the intended learning outcomes of the Bachelor's degree programmes Biology, Chemical Bacteriology and Parasitology, Food Science, and Genomic Biotechnology as defined by UANL correspond with the competences as outlined by the SSC. They come to the following conclusions:

The graduates of the Bachelor's degree programme Biology should be capable to understand and to apply the scientific and technological methods of the biological sciences, and should be familiar with the rational use and management of biological resources, as well as with environmental protection and regulation. In addition, they acquire scientific and technological knowledge in the areas biodiversity, structure and function of living beings, natural resources management, ecological management and environmental impact and

preservation, as well as knowledge and skills that enables them to contribute to scientific development. They learn to work in a team and should adopt an entrepreneurial, creative attitude with a high ethical sense and social commitment. The purpose is to educate biologists with a high sense of responsibility towards living things and the environment and with the ability to conduct research activities.

Due to their broad scientific background in the different areas of the biological sciences the graduates of the Bachelor's degree programme Biology are able to work in various areas of the public and private sector, such as education, health, agriculture, food, forestry, fishery, preservation and environmental management.

The graduates of the Bachelor's degree programme Chemical Bacteriology and Parasitology should be capable to understand and to apply the scientific and technological methods in the areas of chemistry, microbiology and parasitology and should be familiar with ethical and innovative principles of microbiological diversity. This allows them to apply their knowledge and skills in comprehending and solving problems such as the prevention, control or eradication of microbial and parasitic diseases, as well as the application of microbiological quality assurance systems for the well-being of the community, and the design and implementation of biotechnological processes focused on undertaking tasks in health, environment and agriculture.

They also learn how to validate methodologies in chemical, microbiological and biotechnologies laboratories and to diagnose microbial, parasite and chronic degenerative diseases through pathogen identification analysis and biomolecules quantification in human fluids. Finally, the graduates should acquire the necessary knowledge and skills to analyze and to assess biological material using methods of biotechnology and genetic engineering.

Typical fields of occupation are pharmaceutical, biotechnological, food, and petrochemical industries, research centres and laboratories, universities, clinics or public institutions.

The purpose of the Bachelor's degree programme Food Science is to enable the graduates to carry out research activities aimed at improving the production and conservation of food, as well as the development of new products. By acquiring the necessary chemical, nutritional, toxicological and functional knowledge of raw materials and foodstuffs the graduates should be able to coordinate and develop quality control processes and quality assurance systems in the food industry, as well as be capable of making substantiated decisions that allow the continuous improvement of foodstuffs and the development of new products. In addition, they learn about the efficient and suitable usage of physical, chemical and biological raw materials and should be able to understand and analyze nu-

tritious needs by applying current physicochemical, microbiological and biological sensory techniques.

This is achieved by imparting a solid theoretical and practical scientific background in the natural sciences and by imparting the necessary knowledge and skills about the technological preparation, the analysis, the management, and the conservation of foods and food resources. Food scientists can work in areas such as food industry, biotechnology and pharmaceuticals companies, fishery, food resources and agriculture.

The graduates of the Bachelor's degree programme Genomic Biotechnology should be able to apply their knowledge and skills in the area of biotechnology, bioinformatics, proteomics and genomics, proteomic and bioinformatics sciences in order to contribute to the development of the health, agricultural and environmental sectors. By learning about the operation, analysis, content, origin, and evolution of genomes the graduates acquire the competences to manage productive processes, to participate in the marketing of products, to develop new products, and to solve problems in these areas. In addition, they should be capable of designing and implementing new processes and products based on the manipulation of genomes.

The graduates of the Bachelor's degree programme Genomic Biotechnology have several job opportunities; they can work in the food or pharmaceutical industry, in biotechnology companies, in the health sector, as well as in research institutes or in the public administration.

The auditors hold the view that the objectives and intended learning outcomes of the Bachelor's degree programmes under review are reasonable but are worded in too general terms; the description of the qualification profile should more obviously differentiate between the different degree programmes. As a consequence, the peers ask the programme coordinators to re-write the intended learning outcomes for all Bachelor's degree programmes under review in order to adapt them to the specifics of each degree programme. The updated intended learning outcomes should be made available to all stakeholders, e.g. by publishing them on the university's webpage.

For the award of the ASIIN subject-specific label distinctive learning outcomes have to be achieved by First Cycle Programmes. Programme Outcomes as defined by the SSC have been divided into the categories "Specialist Competences" and "Social Competences". The SSC are the result of an assessment, regularly performed by ASIIN Technical Committees, which summarise what is considered as good practice by a professional community formed equally by academics and professional practitioners in higher education and is required as future-oriented quality of training in the labour market. Since all degree pro-

grammes under review have a focus on the different areas of life sciences they are overseen by the Technical Committee Life Sciences.

Based on the Self-Assessment Report and the discussions during the on-site-visit, the peers see that the graduates of the Bachelor's degree programmes acquire the necessary subject-related competences, such as a life science-related sound knowledge of mathematics and the natural sciences, in-depth knowledge and methodological competence in bio sciences and are also able to apply this in other contexts. They also gain methodological competence in the classical core life sciences, are familiar with the hazards caused by handling chemicals, the manipulation of living and non-living material (pathogenic viruses, bacteria, and parasites), are adequately trained on the necessary safety measures and precautions, are able to carry out practical work in laboratories and outdoors independently as well as handle organisms, and have relevant knowledge of safety and environmental issues as well as the associated legal fundamentals. Furthermore, they are able to solve subject-relevant problems, can present the results, have trained their analytical and logical abilities and have an awareness of possible social, ethical and environmental effects of their actions. During the course of their studies, the students have also acquired communicative skills, can work in a team and have developed a strategy for life-long learning. The intended learning objectives are accessible to all stakeholders via the university's webpage.

With respect to social competences the graduates have trained their conceptual, analytical and logical thinking, have an awareness of possible social, ethical and environment-related effects of their actions and can communicate scientific information in a suitable manner. Finally, they also gain some competences in work methodology such as the knowledge and skill to work independently on scientific tasks in biological sciences and to present work results.

In summary, the auditors are convinced that the intended qualification profiles of all degree programmes under review allow the students to take up an occupation which corresponds to their qualification. The degree programmes are designed in such a way that they meet the objectives set for them and the peers judge the objectives and learning outcomes of the degree programmes suitable to reflect the intended level of academic qualification and to correspond with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences. They appreciate that UANL aims for high standards as to give their students good chances in the national job market as well as a good starting point to transfer to other academic programmes to complete a Master and maybe even a PhD-programme.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the peers:
The auditors hold the opinion that the English translation and the original Spanish names of the Bachelor's degree programmes correspond with the intended aims and learning outcomes as well as the main course language.

Criterion 1.3 Curriculum

Evidence:

- Competence-Module-Matrix
- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Webpage Ba Biology http://www.uanl.mx/content/biologo-x (access 17.05.2017)
- Webpage Ba Chemical Bacteriology and Parasitology http://www.uanl.mx/oferta/quimico-bacteriologo-parasitologo-x.html (access 17.05.2017)
- Webpage Ba Food Science http://www.uanl.mx/oferta/licenciatura-en-ciencia-de-alimentos-x.html (access 17.05.2017)
- Webpage Ba Genomic Biotechnology http://www.uanl.mx/oferta/licenciatura-en-biotecnologia-genomica-x.html (access 17.05.2017

Preliminary assessment and analysis of the peers:
The curricula of the Bachelor's degree programmes Biology, Chemical Bacteriology and Parasitology, Food Science, and Genomic Biotechnology are all structured in a similar way.

During the course of the 10 semester long degree programmes the students take classes in the areas General Studies (ACFGU, Área Curricular Formación General Universitaria), Basic Professional (ACFBP, Área Curricular Formación Básica Profesional), Professional (ACFP, Área Curricular Formación Profesional), Elective Studies (ACLE, Área Curricular Libre Elección), and Social Service (SS, Servicio Social).

Courses in General Studies are compulsory parts of each undergraduate programme at UANL and include the following modules: „IT Applications“, „Art Appreciation“, „Communication Competencies“, „Quality Culture“, „Alternative Dispute Resolutions“, „Professional Socialization“, „Environment and Sustainability“, „English Culture”, and „The Scientific Method“ which amount to a total of 20 ECTS credit point. Most ACFGU classes are taken in the first two semesters and were installed in order “to promote comprehensive training for graduates and to develop, in part, the general competencies of the graduation profile”. The peers understand that it useful to offer classes that complement the subject-specific education and impart language, presentation and communication skills. Also an introduction to arts and history and to scientific methods seems reasonable, but the peers criticise that all classes in General Studies are compulsory and that there are no additional options. From their point of view the students should be able to select any class out of the courses offered at UANL that they think are suitable and useful to them. For example classes in economics and business administration are not part of the General Studies but several of the students mentioned that they would like to take classes in this direction. Also the industrial partners of UANL indicated that the graduates are somewhat lacking competences related to sales, commerce, and entrepreneurship.

ACFBP courses are introductory classes that impart the necessary skills and knowledge in the basic natural science (chemistry, biology, and physics) as well as in mathematics and statistics. Professional courses are more advanced and specialised in the subject-specific area of the degree programme and require a higher in-depth understanding of the material. In total Professional and Basic Professional Classes comprise 182 ECTS credit points; in both kinds of courses the students have the possibility to choose between different electives.

In the ninth semester each student must complete the module “Social Service; according to the module description „the purpose of Social Service is to foster learning environments linked with the actual exercise of their profession profile in which they are immersed, which provide services for the benefit of society, the state and the university community“. Since the module description is somewhat vague concerning the content and aim of the module, the peers ask the students, what the course requirements are and how it is organised. They learn that UANL provides a list of approved projects where the students can do their Social Service. The catalogue is relevant for all undergraduate students at UANL and includes projects in private companies, public administration, research institutions or other suitable organisations. The peers gain the impression that Social Service is a short internship and the students underline that they acquire useful competences during this module and that they appreciate the opportunities offered to them, because it is also possible to extend the project done during the Social Service and to do the

final thesis in the same context. For the successful completion of the module "Social Service" the students are awarded 16 ECTS credit points.

All Bachelor's degree programmes under review end with the so called "Elective Studies" in the tenth semester. In the course of this module the students have the option to choose between an internship, a final thesis or a stay abroad. The Elective Studies encompass all of the final semester which is equivalent to 22 ECTS credit points. Under crit. 2.1 the opinion of the peers on these alternatives will be discussed.

According to the Self-Assessment Report for the past five years the College of Biological Sciences has conducted a mathematics and chemistry diagnostic test upon admittance in addition to the admission exam. The results of the diagnostics test have revealed a substantial lack of basic skills and knowledge in mathematics and chemistry. For this reason, the College of Biological Sciences has introduced an additional class for mathematics and chemistry which was voluntary in the beginning. But since many students did not attend the additional classes on Saturdays it was made mandatory for all students in August 2016. The ECTS credits awarded in the respective modules were adjusted accordingly. The peers discuss with the students whether it was helpful to introduce additional classes in mathematics and chemistry and learn that the students hold the opinion that many new students have problems following the classes e.g. in biochemistry, inorganic chemistry, mathematics or physics and that the strengthening of the curriculum in these areas has helped to make up for the deficits.

The peers appreciate the solid education in the basic natural sciences and the classical biological sciences but miss a more intensive education in the modern areas like biotechnology, genetic engineering and molecular biology. Since UANL has included in its intended learning outcomes that the graduates of the Bachelor's degree programmes under review will also acquire competences in these areas; this should also be reflected in the respective curriculum. The graduates should know about the new developments in the area of biological sciences and be familiar with all modern techniques and methods. In order to be able to offer more classes in biotechnology, genetic engineering and molecular biology it would also be necessary to hire new teachers (see crit. 4.1).

With respect to the curriculum of the Bachelor's degree programme Biology the peers point out that the college of Biological Science should focus on laying a sound science-based foundation in general biology (preferably starting with general cell theory, general genetics and then moving to general organism-oriented fields like microbiology, plant biology and zoology, followed by general ecology) in the first 2-4 semesters. The necessary broadness of any undergraduate biology programme should not be mixed up with heterogeneity. Thus, the general biology classes should be accompanied with classes in

chemistry, biochemistry, mathematics/biometry and physics. Students in the field of biological sciences should be in the position to understand the mass action law, the chemistry behind energy metabolism or the biosynthesis of macromolecules, the mathematics necessary in biology and statistics as well as the physics behind analytical methods that are relevant for biology. Widely respected textbooks like the „Campbell's Biology" or „Purves Biology" are good examples for structuring the general biology classes. Furthermore, it is also important that the teachers, who are responsible for the introductory modules, should discuss and compare the contents of their respective modules in order to avoid unnecessary redundancies.

The peers inquire of the programme coordinators whether there are there separate classes in the natural sciences and in mathematics at the College of Biological Sciences or if the students attend the same classes as the chemists, physicists etc. They learn that all classes are specially designed for the students of the undergraduate programmes, which is appreciated by the peers, because this way the characteristic needs and requirements of the students at the College of Biological Sciences can be taken into account.

In addition to the regular classes during the semester UANL also offers a Summer Training Apprenticeship Research Program for Science and Technology (PROVERICYT). The students get the opportunity to participate in research projects with faculty members of the either the College of Biological Sciences or other participating colleges, in some cases, even outside UANL. The programme lasts between 30 to 60 days and is offered during the summer break, no ECTS credit points are awarded. The students emphasise during the discussion with the peers that they take part at the Summer Training Programme to gain more practical experience, to improve their laboratory skills, and to increase their chances at finding an adequate job after graduation. The students utter their satisfaction with the programme and the peers judge this to be a useful supplement to the curriculum.

The peers gain the impression that the graduates of all Bachelor's degree programmes under review are well prepared for entering the labour market and can find adequate jobs either in Nuevo Leon or in Mexico in several different areas such as: food industry, environmental organisations, biotechnology companies, preservation of natural resources, plant protection, vermin control, health care, and public institutions like federal or state ministries. During the discussion with the peers UANL's partner from the industry/public administration confirm that the graduates have a broad scientific education, are very adaptable, and have manifold competences which allows them to find jobs e.g. as research assistants, quality assurance managers or technical experts.

In summary, the auditors are convinced that the intended qualifications profiles of the Bachelor's degree programmes under review allow the students to take up an occupation that corresponds to their qualification.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- General Regulations on the Procedures for Admission and Permanence of Students (Reglamento General sobre los Procedimientos de Admisión y Permanencia de los Alumnos) http://www.fcb.uanl.mx/esp/archivos/reglamentos/6.pdf (access 17.05.2017)
- Regulation on Bachelor's degree entrance examination (Concurso de ingreso a licenciatura) http://www.uanl.mx/alumnos/convocatorias/concurso-de-ingreso-licenciatura.html (access 17.05.2017)

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report the admission procedures and policies for new and returning students and defined in the General Regulations on the Procedures for Admission and Permanence of Students. This regulation is published on UANL's webpage and thus accessible for all stakeholders.

All high school graduates applying for studying at a university in Mexico are required to take the National Enrolment Exam (EXANI II) which is implemented by the National Centre for Educational Evaluations (CENEVAL). This exam consists of a general part that is relevant for all degree programmes, an English Language section and a subject-specific part that differs for the different scientific areas (e.g. natural sciences or engineering). The College of Biological Sciences accepts or rejects applicants based on their EXANI II score.

The details of the application process at UANL and further information on admissions criteria and deadlines can be found in the Regulation on Bachelor's degree entrance examination which is also published on the university's webpage.

The peers inquire of the programme coordinators why the intake of the degree programmes under review differs so much between the fall and the spring term and also from one year to another. Since the high school graduates leave school in summer, the fall term has usually a higher number of applicants than the spring term. Other reasons for the changing number of applicants are the economic situation in Mexico (more new students in times when the situation is better) and the reputation of biological sciences.

However, both the programme coordinators as well as the students do not really know why the demand is so different from one year to the next. The Dean points out that the minimum score in the National Enrolment Exam for the Bachelor‘s degree programmes at the College of Biological Sciences is very high in comparison to other universities and colleges and that they only accept very qualified high school graduates.

In Chapter VII of the General Regulations on the Procedures for Admission and Permanence of Students the procedures for the recognition of academic competences acquired at other (also foreign) institutions of higher education are described. Students have to submit proper documentation of the competences obtained elsewhere; an academic board analyzes the documents and decides if the competences can be recognised as equivalent to certain modules.

In summary, the auditors find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

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

The peers acknowledge that UANL will modify the description of the intended learning outcomes in order to make the differences between the respective Bachelor’s degree programmes more obvious. The planned adjustments go in the right direction but the peers pronounce a requirement and expect that the re-written learning objectives will be made available to all stakeholders.

UANL points out in it its statement that UANL addresses social, professional and academics matters or issues by offering a series of modules called “University General Studies Course´s”. These modules are part of all academic programmes offered by UANL. In addition, the College of Biological Science is developing a comprehensive list of modules that are offered by other colleges within UANL so that the students get an overview what courses can be chosen in the area of “Elective Studies”.

The peers thank UANL for clarifying that the module “Social Service” is a short term activity that students perform for the benefit of the Mexican society. Every student must complete 480 hours of service, this activity is compulsory for all Mexican students.

The College of Biological Sciences agrees that the graduates should know about the new developments in the area of biological sciences and be familiar with all modern techniques and methods. As a result, the programme coordinators work constantly on update the content of the modules. Moreover, the College of Biological has recently signed

agreements with other Colleges of UANL so that the students can take additional classes in agriculture, biotechnology and engineering in order to get familiar with new technologies from these areas. The peers support additional offers but also recommend introducing classes in the modern areas of biological sciences such as biotechnology, bioinformatics and genetic engineering into the core curriculum of the degree programmes.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Competence-Module-Matrix
- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- General Rules of International Relations (Reglamento General de Relaciones Internacionale)
  http://transparencia.uanl.mx/normatividad_vigente/archivos/LyR09/RelacionesInternacionales.pdf (access 17.05.2017)

Preliminary assessment and analysis of the peers:
The Bachelor's degree programmes Biology, Chemical Bacteriology and Parasitology, Genomic Biotechnology, and Food Sciences are designed for 10 semesters; each semester consists of three phases and each phase includes five weeks of lectures and one examination week. With their choice of electives in the area of basic professional and professional classes the students are able to set an individual focus during their studies. The peers are surprised about the length of the degree programmes but learn that all undergraduate programmes in Mexico encompass 10 semesters.

After analyzing the module descriptions and the study plans the peers confirm that all degree programmes under review are divided into modules and that each module is a sum of coherent teaching and learning units. All working practice intervals or internships are well-integrated into the curriculum and the supervision by the College of Biological Sciences guarantees for their respective quality in terms of relevance, content, and structure.

In addition, the peers gain the impression that the choice of modules and the structure of the curriculum guarantees that the intended learning outcomes of the respective degree programme can be achieved and that the students can complete their studies within the expected time frame.

According to the opinion of the peer group the most critical aspect of the Bachelor's degree programmes under review is the fact that there is no compulsory Bachelor's thesis or a final individual project within the curriculum. As the programme coordinators confirm during the audit that the students can chose between an internship, a stay abroad or a final thesis in the last semester of their studies. The peers understand that some of the students who are not planning to continue their academic education with a Master's degree and are therefore not focused on research activities do not want to write a research oriented final thesis but prefer completing an internship in a public institution or a private company. Taking these preferences into account the peers expect that the College of Biological Sciences introduces a final autonomous project either in the form of a research oriented Bachelor's thesis or an internship as a compulsory component of all degree programmes under review. They also insist that in both cases the project must be documented by a written report and possibly an oral presentation which ensures that the students work on a set task independently and at the academic level aimed for.

International Mobility

The students confirm during the discussion with the peers that opportunities for international academic mobility exist and that the College of Biological Sciences has established several exchange programmes with universities in North- and South America and in Europe. The college supports the students in organizing a stay abroad by providing scholarships, language courses and advice. In the last few years the number of undergraduates who spend some time abroad has increased constantly but still only few students chose this option. According to the Self-Assessment Report in 2016 18 students from the College of Biological Sciences have taken part at an international exchange programme.

The peers appreciate the effort to foster international mobility and support the College of Biological Science to further pursue this path. However, the academic mobility is restricted by the English proficiency of the students which limits their opportunities and as a result most of the mobility leads into Spanish-speaking countries. For this reason; the peers encourage to improve the English proficiency of the students for example by offering more English language courses and voluntary classes taught in English. Therefore, the peers recommend that the ability to teach in English should be a criterion when hiring new teaching staff. There are rules for recognising achievements and competences ac-

quired outside UANL, the details are described in the General Rules of International Relations.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Statistical data

Preliminary assessment and analysis of the peers:
The peers appreciate that UANL applies a credit point system that is aligned to the European Credit Transfer and Accumulation System (ECTS). According to the UANL credit system, 30 hours of student workload (including lecture hours and self-study hours) are equivalent to 1 credit point which is in accordance with ECTS. The peers confirm that the workload in hours is indicated in the module descriptions and the distinction between classroom work and self-studies is made transparent and is in line with the credits awarded.

The Bachelor's degree programmes under review are designed for 10 semesters with a total of 220 ECTS credit points including mandatory and elective learning units. This comprises General Studies, Basic Professional and Professional classes, Social Service, and Elective Studies (an internship or a final thesis or a stay abroad). The number of ECTS credit points per semester is set at 22 for all Bachelor's degree programmes at UANL.

The peers discuss with the programme coordinators and the students whether the estimated workload for self-studies is realistic or not. They learn that so far there has been no survey asking the students to evaluate the amount of time they spent outside the classroom for preparing the classes and learning for the exams. Since the peers gain the impression that the estimated workload for self-studies is too low in comparison to the actual time needed by the students they suggest to ask the students directly about their experiences. This could e.g. be done by including a respective question in the teaching evaluations.

The peers ask the programme coordinators if they have detailed statistical data concerning the drop-out rates and the average length of studies, because this information was included in the Self-Assessment Report. The Dean of the College of Biological Sciences provides statistical data with respect to the drop-out rates during the audit. According to

this document the drop-out rates differ significantly between the degree programmes under review and between the different semester groups. The Bachelor's degree programme Biology shows the highest drop-out rates with up to 41% whereas the maximum drop-out rates in the Bachelor's degree programmes Chemical Bacteriology and Parasitology, Genomic Biotechnology and Food Science are 33%, 26% and 23%, respectively.

Asked about the reasons for dropping out the students elaborate that financing the studies is an important issue, because some students run out of money and the future salary of a scientist is not much higher than for somebody without an academic degree. In consequence, some students leave the university and look for some other kind of occupation where they can earn money immediately. Also new students are often unsure about what to study and their expectations of the specific degree programme were not realistic; after one or two semesters at the university they realise that they made the wrong decision and drop out of the degree programme. Finally, students frequently underestimate the necessary scientific background and that a lot of work and effort is necessary to finish a degree programme in the area of biological sciences successfully. The peers can follow this line of argumentation and judge the drop-out rates to be reasonable and not too high.

During the discussion with the peers the students explain that from their experience the average length of studies amounts to 5 to 6 years depending on the personal situation of the students, e.g. if they have to work besides their studies to cover their living expenses or not. Since the College of Biological has not provided any statistical data with respect to the average length of studies the peers ask them to submit this missing information.

Based on the study plans, the statistical data and the comments of the students the auditors conclude that there is no structural pressure on the quality of teaching and the level of education due to the workload. The students express their general satisfaction with the amount and the distribution of their workload.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions

Preliminary assessment and analysis of the peers:
The Bachelor's degree programmes under review make use of several different educational methods for each module such as: practical laboratory work with presentations, case studies, team projects, lectures, social service, and internship or final thesis.

During the classes active and interactive teaching methods (e.g. lectures, discussions, reports, presentations, and group work) are applied. UANL wants to encourage the students to gain knowledge from different scientific areas and wants them to be able to solve specific problems through an interdisciplinary approach. This should ultimately contribute to the transition from a teacher centered to a student oriented teaching method. In order to involve all students in the learning process and to develop their thinking and analytical skills, the teaching staff uses several methods of training and gives assignments on different levels of complexity.

In summary, the peer group judges the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes.

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the peers:
The College of Biological Sciences offers a comprehensive tutorial programme for all undergraduate students. Each tutor is a member of the academic staff and is responsible for a group of 20 to 25 students from his classes. He is a student's first port of call for advice or support on academic or personal matters.

The role of the tutor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the University's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers. The students confirm during the discussion with the peers that they all have a tutor and that they meet regularly and that they can always contact their tutor personally and ask for help or advice. The programme coordinators point out that professors who are tutors receive a special training in order to be able to provide proper advice.

In addition, in 2006 the College of Biological Science introduced the Peer Tutoring Programme (Programa de Pares) that offers tutoring by older students; the tutors receive a scholarship for their service rendered.

The peers learn that the members of the teaching staff are available on any issues regarding the degree programmes and offer academic advice. They appreciate this "open door policy". They also notice the good and trustful relationship between the students and the teaching staff; there are enough resources available to provide individual assistance, advice and support for all students. The support system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay. The students are well informed about the services available to them.

The peers judge the extensive tutorial system to be one of the strong points of the Bachelor's degree programmes at the College of Biological Sciences.

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

UANL points out that upon admission, every student must take an English Placement Test and based on the results the students take classes offered by the Self Taught Language Center (CAADI) and Continuing Education Department. In addition, the College of Biological Science offers six modules in English (mathematics, physics, biostatistics, biochemistry, biology: continuity and unity, biology: diversity and inclusion). It is planned to offer more modules in English, to hire professors with the required English proficiency and to increase the number of teachers attending the English Proficiency Certification programme. The peers strongly support these measures.

Since there was no statistical data about the average length of studies included in the Self-Assessment Report the College of Biological Sciences has submitted this information together with its statement. The analysis was performed identifying the status of all students of the intake year august 2013. This information was extrapolated to estimate how much time it will take for a student to conclude his studies. The peers are satisfied with the results and that the College of Biological Science will include the average length of studies in its follow up statistical analysis.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Module descriptions
- General Regulation of Exams (Reglamento General de Evaluaciones) http://transparencia.uanl.mx/normatividad_vigente/leyesYreg.html (access 17.05.2017)

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report the students' academic performance is evaluated on the basis of their attendance and participation in class, their laboratory works and reports, and the exam at the end of each phase. The form and length of each exam is mentioned in the detailed module descriptions that are available to the students via the electronic platform "Nexus". The academic performance for each module is graded on a scale from 0 to 100. At the end of each semester the students must attain a minimum of 70 points to pass the module. Each semester is divided into three phases; each phase comprises five weeks of lectures and one examination week. If a student fails a module he has a total of six opportunities to pass the module. The further details are determined in UANL's General Regulation of Exams.

The peers discuss with the students how many and what kind of exams they have to take each semester or during/after each phase. They learn that for each class there is one exam in every phase and usually there is a written theoretical and sometimes an additional practical exam or an oral presentation. The final grade is the sum of the sub exams. The exams at the end of each phase are shorter than a final exam for the whole class at the end of the semester would be. The students appreciate that there are a several short exams instead of one big exam and confirm that they are well informed about the examination schedule, the examination form and the rules for grading. The students add the information that most modules also include presentations and laboratory work.

The students only criticise the poor performance of the electronic platform „Nexus". Especially at the end of each phase, when all the students have to upload their presentations and papers the electronic platform is very slow because too many student try to access it at the same time. For this reason the peers recommend to increase the capacity of the electronic platform „Nexus".

The peers confirm that there is a form of assessment for each course and that all students are well informed about the form of assessment and the details of what is required to pass the module. The rules for re-sits, disability compensation, illness and other circumstances are written down in UANL's General Regulation of Exams and therefore transparent to all stakeholders.

As mentioned before under crit. 2.1, the peers expect that part of the compulsory curriculum of each degree programme should be an individual final project, the result of which should be documented in the form of a written report and an oral presentation. This report is usually called "Bachelor's thesis". Projects leading to the Bachelor's thesis could well involve teamwork or could be done in the course of an internship, as this is an important aspect of employability. Putting a stronger emphasis on research activities and involving the Bachelor's students is an important aspect if UANL wants to achieve its goal of becoming a less teaching and more research oriented university.

The peers also inspect a sample of examination papers and final theses and are overall satisfied with the general quality of the samples. They confirm the high standard of the Bachelor's theses, although an abstract in English is sometimes missing.

The peers come to the conclusion that besides the critical issue of an only optional Bachelor's thesis the criteria regarding the examinations system, concept, and organization are fulfilled and that the examinations are suitable to verify whether the intended learning outcomes are achieved or not.

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

The peers see that the College of Biological Sciences currently offers a final thesis as one possible option but will introduce a "Compulsory Professional Practical Project" as a requirement for all students that do not write a final thesis. Since the details are not finalized yet the peers expect that a complete report about the new "Compulsory Professional Practical Project" will be submitted by UANL together with the documents to verify the fulfillment of requirements.

The request for enhancing the capacity of the electronic platform „Nexus**"** was forwarded to UANL's Department of Informatics which is responsible for all technological services administration. The peers appreciate that UANL is currently working on solving this problem.

Since the College of Biological Sciences has already determined that all theses must include an abstract in English they abstain from issuing a corresponding recommendation.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Report
- Staff handbook

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report the teaching staff at the College of Biological Sciences encompasses 174 full time professors, 4 part time professors and 67 adjunct professors. Adjunct professors are not employed by UANL but are working for private companies or public institutions, are paid by the hour, and only give one or two classes per semester. The title "professor" is awarded to every teacher that gives a class at UANL no matter what academic qualification he possesses. Most professors (157) have a PhD, 54 have a Master's degree, and 34 a Bachelor's degree.

The provided staff handbook includes detailed descriptions of the qualification profile of the members of the teaching staff; the peers confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programmes.

The auditors discuss with the programme coordinators, the teachers, and the students if there are enough staff members. They learn that the number of undergraduate students has continually increased during the last years. Since the number of staff members has not increased similarly the teaching load is now between 20 and 25 hours per week. As a consequence, the teachers are primarily concerned with giving lectures and supervising practical work in the laboratories. Thus, time for research activities is very limited.

In order to reduce the workload of the teaching staff the peers recommend hiring more staff members with a special focus on the modern areas of biology (see crit. 2.3) and English proficiency. In addition, it would also be helpful to offer more graduate programmes and to provide more scholarships for PhD and Master's students. They could be employed as research and teaching assistants and therefore lighten the workload of the professors.

The programme coordinators agree that they will need extra staff members as soon as possible especially because several professors will retire in the near future. The Dean of the College of Biological Sciences is well aware of the situation and he promises that UANL will hire new teachers and will lower the teaching load. The auditors support this point of view and expect that adequate measures are taken very soon.

The auditors are very impressed by the excellent and open minded atmosphere among the students and the staff members, this atmosphere of understanding and support is one of the strong points of the degree programme.

Although the time for research activities is limited the scientific output of the College of Biological Sciences is impressive and the auditors conclude that the research activities carried out by the teaching staff are in line with and support the level of academic qualification aimed at.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Staff handbook

Preliminary assessment and analysis of the peers:
UANL encourages the training of its academic staff so it has developed a programme for improving the didactic abilities and teaching methods. According to the Self-Assessment Report in 2016 there were 480 participants from the teaching staff taking part at training workshops, seminars, conferences or language courses.

The peers discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at UANL.

In addition, there is an academic incentive programme for teachers. The possible financial benefits are based on research performance, academic development, tutoring, awards and teaching evaluations.

In summary, the auditors confirm that UANL offers sufficient support mechanisms and opportunities for members of the teaching staff who wish to further develop their professional and teaching skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report
- On-site visit of the laboratories and seminar rooms

Preliminary assessment and analysis of the peers:

During the audit the peer group also visits the laboratories and the class rooms in order to assess the quality of infrastructure and technical equipment. They notice that there are no severe bottlenecks due to missing equipment or a lacking infrastructure. The basic technical equipment is available in sufficient numbers although some of it is not state of the art; there are not enough funds for maintenance and there is a chronic lack of every day materials and chemicals. The students confirm during the discussion with the peers that in general they are satisfied with the available equipment only some materials for the laboratory work are missing and some of the technical equipment is outdated.

As mentioned above the increasing numbers of undergraduates causes some problems, because the infrastructure has not kept pace. As a result, the working places in the laboratories are small, their number is limited, and it would be useful to open new laboratories which would allow teaching smaller groups. The Dean of the College of Biological Sciences confirms towards the peers that the spatial restrictions are a problem and that the college is planning to open up a new building with new laboratories and seminar rooms.

The peers also visit the extensive and very impressive biological collections. Specimen and samples are used and stored for scientific research and the students are regularly involved in collecting new samples and learn how to categorise and preserve them. The peers judge this to be one of the strong points of the College of Biological Sciences.

Finally, the students express their satisfaction with the library opening hours and the available literature. From their point of view there is sufficient access to current international literature and databases and also a remote access is possible.

From the view point of the peers it would be useful to provide more opportunities for the graduates to continue with a Master's degree programme at UANL. During the discussion with the peers a large percentage of the students express their wish to continue their academic education after finishing their Bachelor's degree but since UANL only offers a few Master's degree programmes in the biological sciences most of the graduates will have to leave UANL in order to continue their studies at another university either in Mexico or in another country. Thus, the College of Biological Sciences loses some of their most dedicated and qualified Bachelor's students. For this reason, UANL should think about increasing the number of Master's degree programmes in the area of biological sciences.

Besides the already mentioned restrictions, the auditors judge the available funds, the technical equipment, and the infrastructure (laboratories, library, seminar rooms etc.) to comply with the requirements for sustaining the degree programmes.

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

The peers acknowledge that the teaching load of the professors has been reduced. As a result, 83% of the professors at the College of Biological Science have a teaching load of less than 15 hours. The remaining 17% are recently hired professors who are contractually bound to teach a fixed amount of hours. Because the teaching load has been reduced the peers do not think it is necessary to issue a recommendation in this respect.

Despite the lack of funds, caused by the socio economics situation of Mexico and the nature of a public institution in which 50% of the students have a tuition waiver (scholarship), the College of Biological Sciences tries to appropriately maintain its technical equipment and to provide sufficient materials and reagents. The peers appreciate that the College of Biological Sciences has applied for and received substantial federal grants for lab equipment acquisitions and has tripled its investment in materials and reagents for teaching labs within the last four years. The peers encourage the College of Biological Science to keep up these effort und to try to acquire additional funds.

The peers welcome the College of Biological Sciences is developing nine new graduate programmes. All programmes will be evaluated by the National Organization of Mexican Science and Technology (CONACyT) to be confirmed as “High Quality Programmes”. This will allow students to be eligible for scholarships. The programmes are currently under revision by CONACyT, the college expects the first intake of students by January 2018.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self-Assessment Report
- Module descriptions

Preliminary assessment and analysis of the peers:

During the audit the peers find out that UANL only provided the shortened module descriptions but that there is also a detailed version that is accessible to all students and teachers via the online platform „Nexus“. The shortened version shows several shortcomings: there is no information on the composition of the final grade if there is more than one exam, the name of the teacher responsible for the module is not mentioned, the de-

scription of the module's content is too general but should refer to the specifics of the module and make obvious what is actually taught, the descriptions of the intended learning outcomes are far too general and the literature recommendations are based on quite old papers and textbooks and should be updated.

The programme coordinators point out that the detailed module descriptions include all this information and that they will submit them to the peers. So the peers wait with their final comment concerning the module descriptions until UANL has provided the detailed version as it is available to the students. In addition, the peers notice that the detailed version of the module descriptions is only accessible to students and teachers but is not for other stakeholders. Therefore, they recommend making the detailed version of the module descriptions accessible for all stakeholders e.g. by publishing them on the university's webpage. This would also make it easier for interested high school graduates to get reliable information about the content of degree programmes which could help reducing the number of drop-outs.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Sample Transcript of Records for each degree programme
- Sample Diploma for each degree programme

Preliminary assessment and analysis of the peers:
The peer group notices that no Diploma Supplement is issued after graduation. Instead the graduates receive a Transcript of Records (in English) detailing the grades in every course and the overall final grade. The students also receive a diploma that can be included in job applications.

The auditors point out that a Diploma Supplement should be issued in Spanish and English and should inform about the structure and content of the respective degree programme. It should provide information about the individual performance as well as statistical data regarding the final grade and information about the composition of the final grade according to the ECTS-Users' guide. This allows the reader to categorise the individual result.

The peers insist that all graduates of the degree programmes must be provided with a Diploma Supplement, it should be automatically issued together with UANL's diploma after graduation. The graduates benefit from this standardised document because this

way their academic qualification is more easily recognised abroad, the description of their academic career and the competences acquired during their studies are included, and it offers them easier access to opportunities for work or further studies abroad. Graduation represents the culmination of the students' period of study. Students need to receive documentation explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Report
- All relevant regulations as published on the university's webpage: http://transparencia.uanl.mx/normatividad_vigente/leyesYreg.html

Preliminary assessment and analysis of the peers:
The auditors confirm that the rights and duties of both UANL and the students are clearly defined and binding. All rules and regulations are published on the university website and hence available to all relevant stakeholders.

The only thing the peers find fault with is the fact that the detailed module descriptions are not published on the webpage but are only accessible via the electronic platform „Nexus". In addition, the peers notice that the information on the university's homepage concerning the degree programmes is not correct because the length of the Bachelor's programmes Biology, Chemical Bacteriology and Parasitology, and Food Sciences is mentioned to be nine semesters and not ten semesters. The peers therefore ask the programme coordinators to update the information on the webpage.

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

The peers appreciate that the extended module descriptions are now available on UANL's web page and therefore accessible for all stakeholders.

The College of Biological Science agrees with the request of the peers to issue a Diploma Supplement to all graduates and will work together with other colleges in order to introduce a Diploma Supplement at UANL.

6. Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Annual Activity Report http://www.fcb.uanl.mx/nw/images/informes/1erInforme-de-Actividades-2015-2018-Dr.-Antonio-Guzmn-Velasco.pdf (access 17.05.2017)

Preliminary assessment and analysis of the peers:

The auditors discuss the quality management system at UANL with the programme coordinators. They learn that there is a continuous process in order to improve the quality of the degree programmes and it is carried out through internal and external evaluation. Internal evaluation of the quality of the degree programmes is provided through several surveys. First of all there is a survey called “Cuestionario de la Evaluación al Desempeño Magistrial” that is conducted in all undergraduate and postgraduate degree programmes of UANL. It is organised centrally by the university with the purpose of evaluating the performance of the teachers. This evaluation takes place in every course and in every semester, it includes ten questions, and is done on a paper and pencil basis. As the peers find out during the discussion with the teaching staff and the students the results of the survey are usually not discussed with the students. The programme coordinators confirm that there is no feedback to the students about the course evaluations. If there is negative feedback, the Dean of the College of Biological Sciences talks to the respective teacher, analyses the problems, and offers guidance. The auditors gain the impression that the students’ feedback is taken seriously by the teaching staff and changes are made if there is negative feedback but they think it would also be useful to inform the students about the result of the survey. For this reason, they recommend conducting the survey already after two thirds of the semester and not, as done currently, at the end of the semester. This would give the teachers the opportunity to give a feedback on the results to the students before the end of the semester.

Secondly, the College of Biological Sciences also conducts a survey with respect to the quality of the tutorial system. Since this system is a strong point of the College and the peers are very satisfied with it they see no need to change it.

Finally, one semester prior to graduation UANL conducts a survey to determine the students’ level of satisfaction with the respective degree programme. The so called “Graduate Follow-Up Survey” provides feedback which allows the College of Biological Sciences to determine changes in the job perspectives and future plans of the graduates.

External quality assessment of the degree programmes is provided by the national Mexican accreditation agency.

During the discussion with the representatives of UANL's partners from public institutions and private companies the peers learn that there is only a university wide advisory board but none specifically for the College of Biological Sciences. As the peers consider the input of the employers to be very important for the further improvement of the degree programmes they suggest developing a culture of quality in which all stakeholders are involved in the quality assurance process. Therefore, they recommend establishing an advisory board with representatives from public institutions and private companies specifically for the College of Biological Sciences. This board would also help to stay in contact with the graduates that are now employed in the industry or in the public administration.

In summary, the peer group confirms that the quality management system is suitable to identify weaknesses and to improve the degree programmes. The students are involved in the process but not all feedback loops are closed.

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

The peers acknowledge that the College of Biological Science will discuss the dates on which the course evaluations takes place and will try to establish an advisory board. Since the College can not show any results yet the peers retain the corresponding recommendation.

D Additional Documents

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

D 1. Detailed module descriptions
D 2. Statistical data about the average length of studies

E Comment of the Higher Education Institution (21.08.2017)

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

- **Detailed module descriptions**

Bachelor's Degree Programmes in Biology [Biol]:
http://www.fcb.uanl.mx/nw/es/oferta/licenciatura/14-biologo

Bachelor's Degree Programmes in Chemical Bacteriology and Parasitology [QBP]:
http://www.fcb.uanl.mx/nw/es/oferta/licenciatura/15-quimico-bacteriologo-parasitologo

Bachelor's Degree Programmes in Food Science [LCA]:
http://www.fcb.uanl.mx/nw/es/oferta/licenciatura/16-licenciado-en-ciencias-de-alimentos

Bachelor's Degree Programmes in Genomic Biotechnology [LBG]:
http://www.fcb.uanl.mx/nw/es/oferta/licenciatura/17-licenciado-en-biotecnologia-genomica

- **Statistical data about the average length of studies**

Programme	Yr	Intake	Dropout	Regular	Irregular	Expected to graduate	EFF
BIOL	A13-E18	93	37	11	45	56	60.22%
QBP	A13-E18	138	36	54	48	102	73.91%
LCA	A13-E18	55	17	9	29	38	69.09%
LBG	A13-E18	138	38	56	44	100	72.46%

Table 1. Student average years to conclude a Programme

		YEARS								
Programme	Yr	5	5.5	6	6.5	7	7.5	8	8.5	AVE YR
BIOL	A13-E18	11	18	18	6	3	0	0	0	5.75
QBP	A13-E18	54	24	16	3	4	0	1	0	5.43
LCA	A13-E18	9	17	3	2	4	1	2	0	5.82
LBG	A13-E18	56	25	8	4	4	2	1	0	5.43

Table 2. Student average semesters to conclude a Programme

		SEMESTERS								
Programme	Yr	10	11	12	13	14	15	16	17	AVE SEM
BIOL	A13-E18	11	18	18	6	3	0	0	0	11.50
QBP	A13-E18	54	24	16	3	4	0	1	0	10.85
LCA	A13-E18	9	17	3	2	4	1	2	0	11.63
LBG	A13-E18	56	25	8	4	4	2	1	0	10.85

F Summary: Peer recommendations (01.09.2017)

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2022
Ba Chemical Bacteriology and Parasitology	With requirements for one year	-	30.09.2022
Ba Food Science	With requirements for one year	-	30.09.2022
Ba Genomic Biotechnology	With requirements for one year	-®	30.09.2022

Requirements

For all degree programmes

A 1. (ASIIN 1.1) Re-write the learning objectives so that they make obvious the academic, subject-specific and professional classification of the qualifications gained in the degree programmes and make them available to all stakeholders.

A 2. (ASIIN 3) Make sure that the degree programme comprises a thesis or final project which ensures that students work on a set task independently and at the level aimed for.

A 3. (ASIIN 5.2) Issue a Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student. Provide statistical data according to the ECTS-Users' guide in addition to the final grade.

A 4. (ASIIN 5.) Make the information on the university's webpage consistent with the current study plans.

A 5. (ASIIN 6) Ensure that the students get a feedback about the results of the teaching evaluations.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended offering electives in the area of General Studies.

E 2. (ASIIN 1.3) It is recommended introducing more classes in the modern areas of biological sciences such as biotechnology, bioinformatics and genetic engineering and hire new staff members that are qualified to teach these classes.

E 3. (ASIIN 4.1) It is recommended that new members of the teaching staff have sufficient English proficiency**.**

E 4. (ASIIN 4.3) It is recommended to provide more funds for updating and maintaining the technical equipment.

E 5. (ASIIN 4.3) it is recommended to update and to expand the infrastructure in order to be able to accommodate the rising number of Bachelor's students.

E 6. (ASIIN 6) It is recommended creating an advisory board with all stakeholders specifically for the College of Biological Sciences.

For the Bachelor's degree programme Biology

E 7. (ASIIN 1.3) It is recommend offering general classes as an introduction to biology in the first semesters.

G Comment of the Technical Committees (19.09.2017)

Technical Committee 08 - Agriculture, Nutritional Sciences and Landscape Architecture (18.09.2017)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee fully agrees with the assessment and the recommended resolution of the expert panel. In the discussion the committee members question whether the technical equipment is already good enough to operate the degree programmes; they receive the impression that from the peers' perspective the equipment has been generally found satisfying in both substance and extent, although there still seems to be some room for improvement. Following this, the Technical Committee considers the proposed recommendation E4 quite appropriate.

The Technical Committee 08 - Agriculture, Nutritional Sciences and Landscape Architecture recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2022
Ba Chemical Bacteriology and Parasitology	With requirements for one year	-	30.09.2022
Ba Food Science	With requirements for one year	-	30.09.2022
Ba Genomic Biotechnology	With requirements for one year	-®	30.09.2022

Technical Committee 09 - Chemistry (19.09.2017)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee sees that UANL has recognized the shortcomings in the technical equipment of the laboratories and the increasing need for space, and plans to improve the situation in a timely manner. UANL has expressed a very constructive attitude and made it clear that it will take up and implement the proposals of the peers. With re-

gard to the requirements and recommendations, the Technical Committee follows fully the recommendations of the peers.

The Technical Committee 09 - Chemistry recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2022
Ba Chemical Bacteriology and Parasitology	With requirements for one year	-	30.09.2022
Ba Food Science	With requirements for one year	-	30.09.2022
Ba Genomic Biotechnology	With requirements for one year	-®	30.09.2022

Technical Committee 10 – Life Sciences (07.09.2017)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee welcomes the fact that the University is constructive about the criticism of the peers and has announced that the expected changes will be carried out promptly. The Technical Committee does not make any changes to the stipulated requirements and recommendations, but follows the recommendations of the peers without restriction.

The Technical Committee 10 – Life Sciences recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2022
Ba Chemical Bacteriology and Parasitology	With requirements for one year	-	30.09.2022
Ba Food Science	With requirements for one year	-	30.09.2022
Ba Genomic Biotechnology	With requirements for one year	-®	30.09.2022

H Decision of the Accreditation Commission (29.09.2017)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission discusses about the procedure, especially about recommendation E2. The Accreditation Commission sees that the scientific standards in the area of modern biological sciences are fulfilled and therefore agrees with the wording of the recommendation and does not want to change it into a requirement. As a result, the Accreditation Commission follows the stipulated requirements and recommendations without any changes.

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

Degree Programme	ASIIN seal	Subject-specific Label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2022
Ba Chemical Bacteriology and Parasitology	With requirements for one year	-	30.09.2022
Ba Food Science	With requirements for one year	-	30.09.2022
Ba Genomic Biotechnology	With requirements for one year	-	30.09.2022

Requirements

For all degree programmes

A 1. (ASIIN 1.1) Re-write the learning objectives so that they make obvious the academic, subject-specific and professional classification of the qualifications gained in the degree programmes and make them available to all stakeholders.

A 2. (ASIIN 3) Make sure that the degree programme comprises a thesis or final project which ensures that students work on a set task independently and at the level aimed for.

A 3. (ASIIN 5.2) Issue a Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the aca-

demic level of the degree programme as well as about the individual performance of the student. Provide statistical data according to the ECTS-Users' guide in addition to the final grade.

A 4. (ASIIN 5.) Make the information on the university's webpage consistent with the current study plans.

A 5. (ASIIN 6) Ensure that the students get a feedback about the results of the teaching evaluations.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended offering electives in the area of General Studies.

E 2. (ASIIN 1.3) It is recommended introducing more classes in the modern areas of biological sciences such as biotechnology, bioinformatics and genetic engineering and hire new staff members that are qualified to teach these classes.

E 3. (ASIIN 4.1) It is recommended that new members of the teaching staff have sufficient English proficiency**.**

E 4. (ASIIN 4.3) It is recommended to provide more funds for updating and maintaining the technical equipment.

E 5. (ASIIN 4.3) it is recommended to update and to expand the infrastructure in order to be able to accommodate the rising number of Bachelor's students.

E 6. (ASIIN 6) It is recommended creating an advisory board with all stakeholders specifically for the College of Biological Sciences.

For the Bachelor's degree programme Biology

E 7. (ASIIN 1.3) It is recommend offering general classes as an introduction to biology in the first semesters.

I Fulfilment of Requirements (28.09.2018)

Analysis of the peers and the Technical Committees (17.09.2018)

Requirements

For all degree programmes

A 1. (ASIIN 1.1) Re-write the learning objectives so that they make obvious the academic, subject-specific and professional classification of the qualifications gained in the degree programmes and make them available to all stakeholders.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The learning outcomes have been revised and are now to all stakeholders on the college's website.
TC 08	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 10	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.

A 2. (ASIIN 3) Make sure that the degree programme comprises a thesis or final project which ensures that students work on a set task independently and at the level aimed for.

Initial Treatment	
Peers	partly fulfilled Vote: unanimous Justification: The College of Biological Sciences offers 22 credits of elective coursework. Possible options are Thesis work, Student Mobility, Internship, or Course work. An individual final project is therefore not compulsory.

TC 08	not fulfilled Vote: unanimous Justification: Since a Bachelor Thesis or a final project is still no binding requirement of the study programmes but an optional element instead, the Technical Committee concludes that requirement 2 is not fulfilled.
TC 09	not fulfilled Vote: unanimous Justification: The Technical Committee agrees with the opinion of the experts and regards condition A 2 as not fulfilled.
TC 10	not fulfilled Vote: unanimous Justification: The TC expects that a thesis or final project is part of the compulsory curriculum.

A 3. (ASIIN 5.2) Issue a Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student. Provide statistical data according to the ECTS-Users' guide in addition to the final grade.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: UANL now issues a Diploma Supplement.
TC 08	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 10	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.

A 4. (ASIIN 5.) Make the information on the university's webpage consistent with the current study plans.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The information on the college's webpage has been

	updated.
TC 08	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 10	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.

A 5. (ASIIN 6) Ensure that the students get a feedback about the results of the teaching evaluations.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The teachers are required to give the students feedback about the results of the course evaluations.
TC 08	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 09	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.
TC 10	fulfilled Vote: unanimous Justification: The TC follows the peers' judgement.

Decision of the Accreditation Commission (28.09.2018)

Degree programme	**ASIIN-label**	**Subject-specific label**	**Accreditation until max.**
Ba Biology	Requirement A 2 not fulfilled	--	6 months prolongation
Ba Chemical Bacteriology and Parasitology	Requirement A 2 not fulfilled	--	6 months prolongation

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Food Science	Requirement A 2 not fulfilled	--	6 months prolongation
Ba Genomic Biotechnology	Requirement A 2 not fulfilled	--	6 months prolongation

The Accreditation Commission justifies its decision as follows:

“The Accreditation Commission sees that possible options are Thesis work, Student Mobility, Internship, or Course work. An individual final project is therefore not compulsory for all students.

In order to fulfil the requirement the College of Biological sciences has to make sure, that all students do an individual final project.”

J Fulfilment of Requirements (29.03.2019)

Analysis of the peers and the Technical Committees (08.03.2019)

Requirements

For all degree programmes

A 2. (ASIIN 3) Make sure that the degree programme comprises a thesis or final project which ensures that students work on a set task independently and at the level aimed for.

Initial Treatment	
Peers	partly fulfilled Vote: unanimous Justification: The College of Biological Sciences offers 22 credits of elective coursework. Possible options are Thesis work, Student Mobility, Internship, or Course work. An individual final project is therefore not compulsory.
TC 08	not fulfilled Vote: unanimous Justification: Since a Bachelor Thesis or a final project is still no binding requirement of the study programmes but an optional element instead, the Technical Committee concludes that requirement 2 is not fulfilled.
TC 09	not fulfilled Vote: unanimous Justification: The Technical Committee agrees with the opinion of the experts and regards condition A 2 as not fulfilled.
TC 10	not fulfilled Vote: unanimous Justification: The TC expects that a thesis or final project is part of the compulsory curriculum.
AC	not fulfilled Vote: unanimous Justification: The Accreditation Commission sees that possible options are Thesis work, Student Mobility, Internship, or Course work. An individual final project is therefore not compulsory for all students.
Second Treatment	
Peers	fulfilled

	Vote: unanimous Justification: For each option (Thesis Work, Student Mobility, Internship, Course Work) students are obliged to write a final project and conduct an oral presentation.
TC 08	fulfilled Vote: unanimous Justification: The TC considers the requirement to be fulfilled.
TC 09	fulfilled Vote: per majority Justification: Justification: UANL has submitted documents showing that each student prepares an individual thesis, even if the quality of the work varies considerably. As it is not clear to the TC how the different projects will be evaluated and what part the oral presentation will have, it proposes to include a reference in the cover letter to the university.
TC 10	fulfilled Vote: unanimous Justification: UANL has submitted documents showing that each student prepares an individual thesis, even if the quality of the work varies considerably. As it is not clear to the TC how the different projects will be evaluated and what part the oral presentation will have, it proposes to include a reference in the cover letter to the university.

Decision of the Accreditation Commission (29.03.2019)

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Biology	Requirement A2 fulfilled	--	30.09.2022
Ba Chemical Bacteriology and Parasitology	Requirement A2 fulfilled	--	30.09.2022
Ba Food Science	Requirement A2 fulfilled	--	30.09.2022
Ba Genomic Biotechnology	Requirement A2 fulfilled	--	30.09.2022

The Accreditation Commission decides to include the following hint into the notifying letter to the HEI:

“In the course of the re-accreditation process, it will be verified that the same quality standards are applied for all four types of final reports, that the quality of the reports is sufficient and how the oral presentations are taken into account in the module grade.”

Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Biology:

„The educational program trains highly qualified professionals, by

- Gaining knowledge and skills to successfully in manage and run biodiversity and conservation programs or projects, considering legal framework.
- Promoting and protecting natural resources, animals in danger of extinction, public health and agricultural activities.
- Developing environmental solutions considering sustainable development within social diversity.

The Biology Biodiversity Programme has been developed for its students throughout his or her progression to achieve three specific competences, which are:

- Manage Biodiversity from its biological processes to generate basic and applied knowledge.
- Preserve ecosystem and societies sustainable development by developing social, environmental and biological processes methodologies.
- Apply evolutionary theories in a holistic way to gain knowledge to manage that biodiversity for its sustainable development.
- Strategic planning of natural resources thru environmental policies considering local, national and international ecosystems
- To manage biological processes for conservation of flora and fauna, as well as the proper use of biotic resources by developing ecosystem conservation and preventive environmental problem strategies methodologies
- Implement alternative solutions and prevent natural sciences problems"

The following **curriculum** is presented:

UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN / FACULTAD DE CIENCIAS BIOLOGICAS
MALLA CURRICULAR DEL PROGRAMA EDUCATIVO DE BIÓLOGO

1° Semestre	2° Semestre	3° Semestre	4° Semestre	5° Semestre	6° Semestre	7° Semestre	8° Semestre	9° Semestre	10° Semestre
2 Aplicación de las tecnologías de información Ob ACFGU	2 Apreciación a las artes Ob ACFGU	2 Tópicos selectos de ciencias sociales, artes y humanidades Op ACFGU	2 Contexto social de la profesión Ob ACFGU	2 Tópicos selectos para el desarrollo académico y profesional Op ACFGU	2 Tópicos selectos de lenguas y culturas extranjeras Op ACFGU	2 Bionegocios Ob ACFBP	2 Ética, sociedad y profesión Ob ACFGU	3 Administración de recursos naturales Ob ACFP	22 Libre Elección Op
2 Competencia comunicativa Ob ACFGU	4 Química orgánica Ob ACFBP	2 Tópicos selectos de desarrollo humano, salud y deportes Op ACFGU	3 Fisicoquímica Ob ACFBP	3 Biofísica Ob ACFBP	2 Ambiente y sustentabilidad Ob ACFGU	4 Optativa ACFP V Op ACFP	4 Ecología cuantitativa Ob ACFP	3 Biogeografía Ob ACFP	
4 Matemáticas Ob ACFBP	3 Física Ob ACFBP	3 Bioestadística Ob ACFBP	3 Diseño experimental Ob ACFBP	3 Biología celular Ob ACFP	3 Morfofisiología de cordados Ob ACFP	3 Paleobiología Ob ACFP	4 Biosistemática Ob ACFP	16 Servicio Social Ob	
4 Química inorgánica Ob ACFBP	3 Optativa ACFBP I Op ACFBP	4 Bioquímica Ob ACFBP	3 Optativa ACFBP III Op ACFBP	3 Genética Ob ACFP	4 Biodiversidad de cordados Ob ACFP	3 Biotecnología Ob ACFP	3 Optativa ACFP VI Op ACFP		
3 Métodos biológicos de laboratorio y campo Ob ACFP	2 Biología su historia y filosofía Ob ACFP	3 Optativa ACFBP II Op ACFBP	3 Histología comparada Ob ACFP	3 Morfofisiología de plantas vasculares Ob ACFP	3 Biología molecular Ob ACFP	3 Evolución Ob ACFP	3 Optativa ACFP VII Op ACFP		
4 Biología: unidad y continuidad Ob ACFP	4 Microbiología Ob ACFP	4 Biodiversidad de criptógamas Ob ACFP	4 Optativa ACFP I Op ACFP	4 Biodiversidad de gimnospermas y angiospermas Ob ACFP	4 Optativa ACFP III Op ACFP	3 Biología del desarrollo Ob ACFP	3 Optativa ACFP VIII Op ACFP		
3 Fisiografía y climas Ob ACFP	4 Biología: diversidad e integración Ob ACFP	4 Biodiversidad de invertebrados no artrópoda Ob ACFP	4 Optativa ACFP II Op ACFP	4 Biodiversidad de artrópodos Ob ACFP	4 Optativa ACFP IV Op ACFP	4 Ecología Ob ACFP	3 Optativa ACFP IX Op ACFP		

FIRST SEMESTER	Credits	Structure
IT applications	2	ACFGU
Communication competencies	2	ACFGU
Mathematics	4	ACFBP
Inorganic chemistry	4	ACFBP
Field and laboratory biological methods	3	ACFP
Biology: continuity and unity	4	ACFP
Physiography and climate	3	ACFP
Total	**22**	

SECOND SEMESTER		Credits	Structure
Selected topics for social sciences, arts and humanities: art appreciation		2	ACFGU
Organic chemistry		4	ACFBP
Physics		3	ACFBP
History and philosophy of biology		2	ACFP
Microbiology		4	ACFP
Biology: diversity and inclusion		4	ACFP
Basic professional elective	Basic French	3	ACFBP I
	Basic English		
Total		**22**	

THIRD SEMESTER		Credits	Structure
Selected topics of social sciences, arts, and humanity: alternative dispute resolutions		2	ACFGU
Selected topics for human development, health and sports: quality culture		2	ACFGU
Biostatistics		3	ACFBP
Biochemistry		4	ACFBP
Cryptogram biodiversity		4	ACFP
Non-arthropod invertebrates biodiversity		4	ACFP
Basic professional elective	Intermediate French	3	ACFBP II
	Intermediate English		
	Total	**22**	

FOURTH SEMESTER		Credits	Structure
Professional socialization		2	ACFGU
Physical chemistry		3	ACFBP
Experimental design		3	ACFBP
Comparative histology		3	ACFP
Basic professional elective	Advanced French	3	ACFBP III
	Advanced English		
Professionalizing elective	Cryptogamae fungi	4	ACFP I
	Cryptogamae algae		
Professionalizing elective	parasitology of non-arthropod invertebrates	4	ACFP II
	Protozoology		
	Total	**22**	

FIFTH SEMESTER	Credits	Structure
Selected topics for academic and professional development: the scientific method	2	ACFGU
Biophysics	3	ACFBP
Cellular biology	3	ACFP
Genetics	3	ACFP
Morphophysiology of vascular plants	3	ACFP
Arthropod biodiversity	4	ACFP
Gymnosperm and angiosperm biodiversity	4	ACFP
Total	**22**	

SIXTH SEMESTER		Credits	Structure
Selected topics for foreign culture and languages: English culture		2	ACFGU
Morphophysilogy of chordates		3	ACFP
Environment and sustainability		2	ACFGU
Chordate biodiversity		4	ACFP
Molecular biology		3	ACFP
Professionalizing elective	Angiosperms	4	ACFP III
	Gymnosperms		
Professionalizing elective	crustacean biology	4	ACFP IV
	Non-insects arthropods of importance for mankind		
	Applied entomology		

SEVENTH SEMESTER		Credits	Structure
Biobusiness		2	ACFBP
Paleobiology		3	ACFP
Biotechnology		3	ACFP
Evolution		3	ACFP
Developmental biology		3	ACFP
Ecology		4	ACFP
Professionalizing elective	biology of chordates	4	ACFP V
	Animal ethology		
	Total	**22**	

EIGHTH SEMESTER		Credits	Structure
Professional social ethics		2	ACFGU
Quantitative ecology		4	ACFP
Biosystematics		4	ACFP
Professionalizing elective	Population genetics	3	ACFP VI
	Molecular ecology		
	Environmental impact and mitigation		
	Urban ecology		
Professionalizing elective	Fundamentals of biology conservation	3	ACFP VII
	Fish and wildlife management		
	Genetic evolution		
	Ecosystem recovery		
Professionalizing elective	Ecological communities.	3	ACFP VIII
	Bionformatics and genomics		
	Ecological planning and management plans.		
	Environmental contamination and toxicology		
Professionalizing elective	Sustainable development	3	ACFP IX
	Genomic and proteomic techniques		
	Plant resources management		
	Climate change and clean technologies		
	Total	**22**	

NINTH SEMESTER	Credits	Structure
Biogeography	3	ACFP
Management of natural resources	3	ACFP
Social service	16	SS
Total	**22**	

TENTH SEMESTER		Credits	Structure
Elective	The undergraduate research thesis	22	ACLE
	Student exchange or mobility		
	Professional internships		
	Total	**22**	

According to the Self-Assessment Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Chemical Bacteriology and Parasitology:

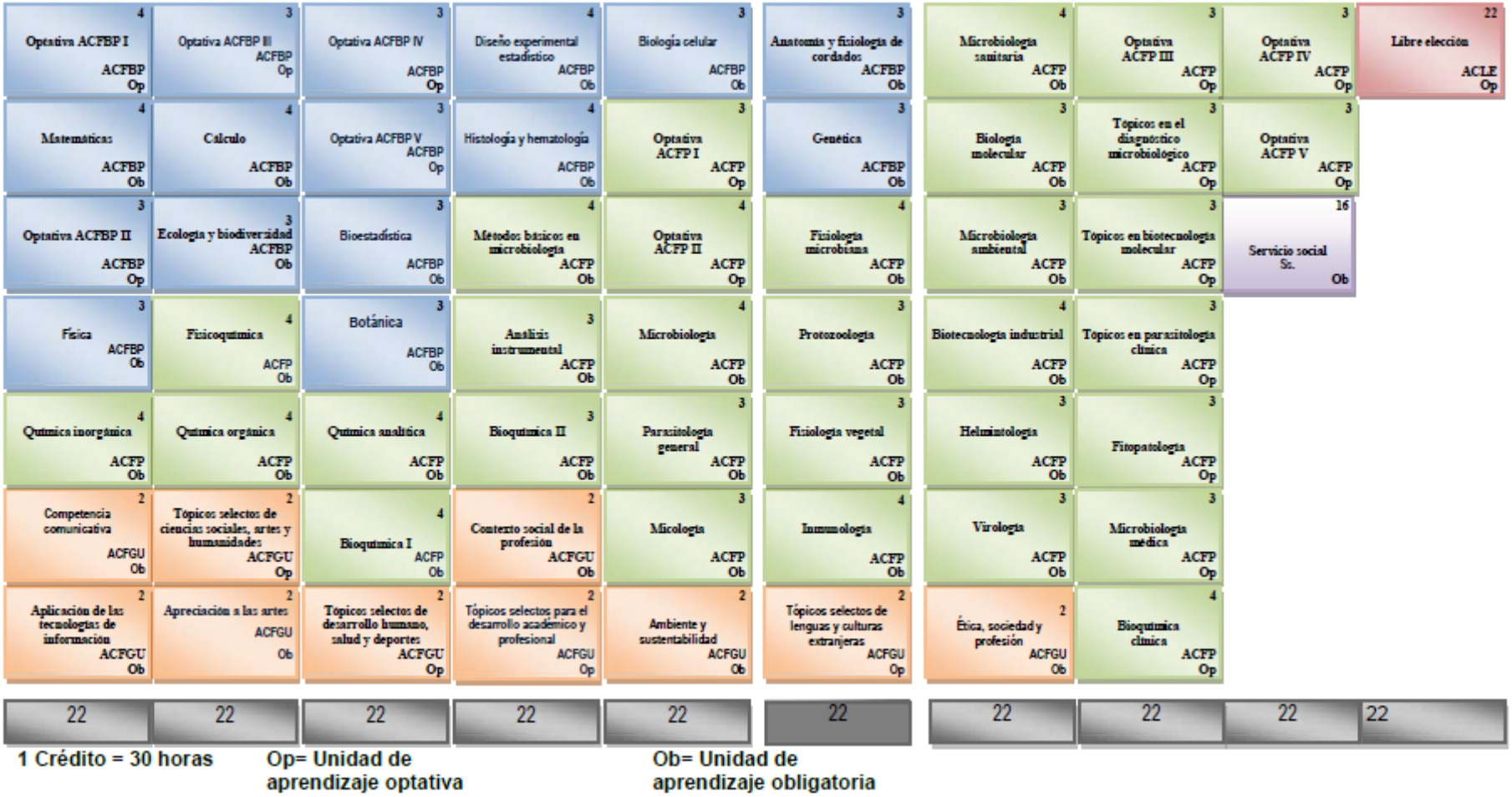
„To train competitive, entrepreneurs and innovating Chemical Bacteriology-Parasitology professionals with by:

- Instilling ethical principles and socially responsible values, with an integral vision in the sustainable use of microbiological diversity.
- Gaining knowledge for implementing and validating of laboratory methods and risk assessments to prevent and control microbial and parasites diseases,
- Gaining knowledge to implement quality management systems and biotechnological processes for the community wellbeing through problem-solving in the health, environmental, agricultural and industrial sectors with an inter, intra and transdisciplinary focus.

The Chemical Bacteriology and Parasitology has been developed for its students throughout his or her progression to achieve three specific competences, which are:

- Value the microbiological diversity based on its general and specific characteristics, with a sustainable perspective, to contribute to the resolution of heath, environment, agricultural and industrial problems.
- Validate methodologies in chemical, microbiological and biotechnologies Labs. For the functional analysis of such systems and industrial processes that guarantee reliable results for the decision making.
- Contribute to the diagnosis of health and microbial, parasite and chronic degenerative diseases through pathogen identification analysis and biomolecules quantification in biological, human fluids with a high level of confidence to preserve community health and wellbeing.
- Guarantee clinical, microbiological and biotechnological processes quality through continues improvement systems implementing and applying risks assessment control methods to ensure the accomplishment of a client requirements to comply with the norm
- Asses the enzymes, microbial, vegetables and animal cells biotechnology potential, using recombinant biotechnology and genetic engineering, to produce goods and services useful in health, agricultural, industrial and environmental sectors."

The following **curriculum** is presented:



FIRST SEMESTER		Credits	Curricula
Communication competencies		2	ACFGU
IT applications		2	ACFGU
Mathematics		4	ACFBP
Physics		3	ACFBP
Inorganic chemistry		4	ACFBP
Basic professional elective	Basic English	4	ACFBP I
	Drafting of technical and scientific documents		
Basic professional elective	Quality management	3	ACFBP II
	Metrology and validation		
	Total	**22**	

SECOND SEMESTER			
Selected topics of social sciences, arts, and humanity: alternative dispute resolutions		2	ACFGU
Selected topics for social sciences, arts and humanities: art appreciation		2	ACFGU
Calculus		4	ACFBP
Ecology and biodiversity		3	ACFBP
Physic chemistry		4	ACFP
Organic chemistry		4	ACFP
Basic professional elective	Mid level English	3	ACFBP III
	Safety on chemistry lab	3	ACFBP III
	Total	**22**	

THIRD SEMESTER			
Selected topics for human development, health and sports: quality culture		2	ACFGU
Biostatistics		3	ACFBP
Botanic		3	ACFBP
Analytic chemistry		4	ACFP
Biochemistry I		4	ACFP
Basic professional elective	Bioinformatics	3	ACFBP IV
	Biosafety		
Basic professional elective	Advanced English	3	ACFBP V
	Emotional intelligence and career	3	
	Total	**22**	

FOURTH SEMESTER			
Professional socialization		2	ACFGU
Selected topics for academic and professional development: the scientific method		2	ACFGU
Statistic experimental design		4	ACFBP
Histology and hematology		4	ACFBP
Basic methods on microbiology		4	ACFP
Instrumental analysis		3	ACFP
Biochemistry II		3	ACFP
	Total	**22**	

FIFTH SEMESTER			
Environment and sustainability		2	ACFGU
Cell biology		3	ACFBP
Microbiology		4	ACFP
General parasitology		3	ACFP
Mycology		3	ACFP
Basic professional elective	Hygiene and sanitation	3	ACFP I
	Food quality systems	3	ACFP I
	Quality management	3	ACFP I
Basic professional elective	Sensorial evaluation	3	ACFP II
	Metrology and validation	4	ACFP II
	Bromatological analysis	4	ACFP II
	Total	**22**	

SIXTH SEMESTER		
Selected topics for foreign culture and languages: english culture	3	ACFBP
Anatomy and physiology of chordates	3	ACFBP
Genetics	4	ACFBP
Microbial physiology	4	ACFP
Protozoology	3	ACFP
Plant physiology	4	ACFP
Immunology	3	ACFP
Total	**22**	

SEVENTH SEMESTER		
Professional social ethics	2	ACFBP
Sanitary microbiology	4	ACFP
Molecular biology	3	ACFP
Environmental microbiology	3	ACFP
Industrial biotechnology	4	ACFP
Helminthology	3	ACFP
Virology	3	ACFP
Total	**22**	

EIGHTH SEMESTER			
Topics in microbiological diagnosis		3	ACFGU
Topics in molecular biotechnology		3	ACFP
Topics in clinical parasitology		3	ACFP
Phytopathology		3	ACFP
Medical microbiology		3	ACFP
Clinical biochemistry		4	ACFP
Basic professional elective	Molecular diagnosis of microbial diseases	3	ACFP III
	Pathology and epidemiology of microbial diseases		
	Clinical virology		

NINTH SEMESTER			
Basic professional elective	Predictive microbiology	3	ACFP IV
	Vectors and animal health		
	Diagnosis and control of plant diseases		
Basic professional elective	Agricultural biotechnology	3	ACFP V
	Environmental biotechnology		
	Plant biotechnology		
Social service		16	SS
	Total	**22**	

TENTH SEMESTER			
Elective	The undergraduate research thesis	22	ACLE
	Student exchange or mobility		
	Internships		
	Total	**22**	

According to the Self-Assessment Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Food Science:

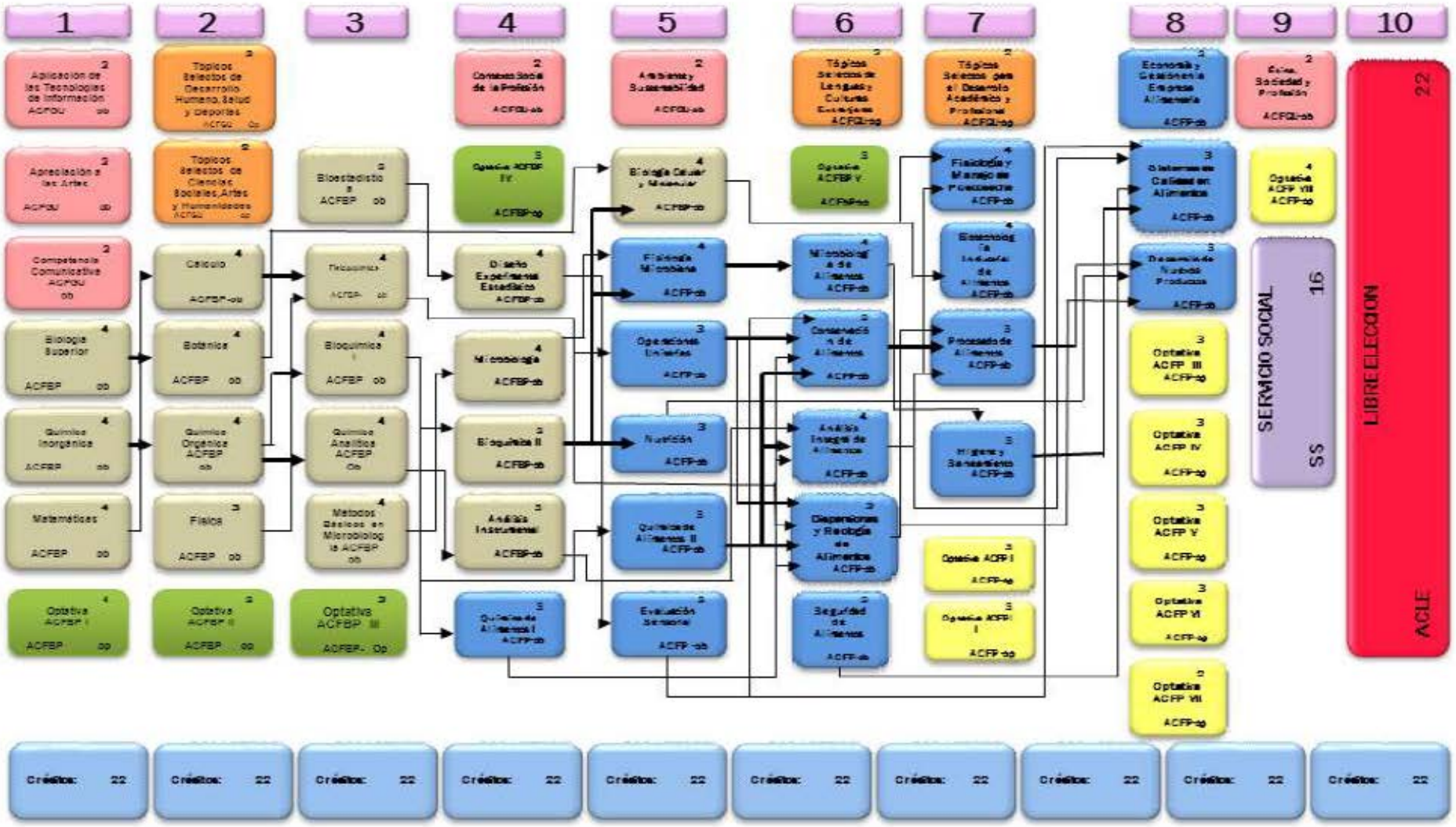
To train competitive professionals capable of designing, evaluating and supervising the appropriate conditions of food handling, storage and processing by

- Developing and implementing quality assurance and control systems for the Food Industry.
- Applying the scientific method for development of new products considering legal framework, storage, handling and process conditions.
- Promoting ethics, social responsibility and respect for nature and sustainable development, to improve conservation and food production processes.

The Food Science programme has been developed for its students throughout his or her progression to achieve specific competences, such as, to:

- Develop food conservation quality and safety management skills.
- Develop food process optimization and evaluation process of raw materials physical, chemical and biological characteristics knowledge.
- Develop nutritious food and supplements needs.
- Use physicochemical, microbiological, biological and sensory techniques of food analysis considering regulations and / or characteristics of leading products knowledge.
- Implement quality assurance systems skills for food process, considering national and international norms and analytical techniques for decision making for continuous and or sustained improvements."

The following **curriculum** is presented:



FIRST SEMESTER		Credits	Structure
IT applications		2	ACFGU
Selected topics for social sciences, arts and humanities: art appreciation		2	ACFGU
Communication competencies		2	ACFGU
Upper biology		4	ACFBP
Inorganic chemistry		4	ACFBP
Mathematics		4	ACFBP
Basic professional elective	Basic English	4	ACFBP I
	Introduction to chemistry lab		
	Total	**22**	

SECOND SEMESTER		Credits	Structure
Selected topics for human development, health and sports: quality culture		2	ACFGU
Selected topics of social sciences, arts, and humanity: alternative dispute resolutions		2	ACFGU
Calculus		4	ACFBP
Botany		4	ACFBP
Organic chemistry		4	ACFBP
Physics		3	ACFBP
Basic professional elective	Mid-level English	3	ACFBP II
	Introduction to administration		
	Lab administration		
	Total	**22**	

THIRD SEMESTER		Credits	Structure
Biostatistics		3	ACFBP
Physical chemistry		4	ACFBP
Biochemistry I		4	ACFBP
Analytical chemistry		4	ACFBP
Basic methods on microbiology		4	ACFBP
Basic professional elective	Advanced English	4	ACFBP III
	Introduction to administration		
	Lab administration		
	Total	**22**	

FOURTH SEMESTER		Credits	Structure
Professional socialization		2	ACFGU
Statistics and experimental design		3	ACFBP
Microbiology		3	ACFBP
Biochemistry II		3	ACFBP
Instrumental analysis		3	ACFBP
Food chemistry I		4	ACFP
Basic professional elective	Metrology and validation	3	ACFB IV
	Food parasitology		
	Mycology		
Total		**22**	

FIFTH SEMESTER	Credits	Structure
Environment and sustainability	2	ACFGU
Cell and molecular biology	2	AFCBP
Microbial physiology	3	ACFP
Unitarian operations	4	ACFP
Nutrition	3	ACFP
Food chemistry II	4	ACFP
Sensorial evaluation	4	ACFP
Total	**22**	

SIXTH SEMESTER		Credits	Structure
Selected topics for foreign culture and languages: English culture		2	ACFGU
Food microbiology		2	ACFP
Food conservation		4	ACFP
Integral analysis of feed		4	ACFP
Dispersion and rheology of food		3	ACFP
Food safety		3	ACFP
Basic professional elective	Metrology and validation	3	ACFBP V
	Food parasitology		
	Mycology		
	Food nutritional evaluation		
Total		**22**	

SEVENTH SEMESTER		Credits	Structure
Selected topics for academic and professional development: the scientific method		2	ACFGU
Postharvest management physiology		4	ACFP
Food industry biotechnology		4	ACFP
Food processing		3	ACFP
Hygienic and sanitation		3	ACFP
Professionalizing elective	Topics on diagnostic microbiology	3	ACFP I
	Predictive microbiology		
	Biophysics		
	Management and marketing on food of plant origin		
	Management and marketing on food of animal origin		
	Topics on diagnostic microbiology	3	ACFBP II

Professionalizing elective	Predictive microbiology		
	Biophysics		
	Management and marketing of food of animal origin		
	Management and marketing of food of plan origin		
	Food technology of animal origin		
	Food technology of plant origin		
	Total	**22**	

EIGHTH SEMESTER		Credits	Structure
Economy and management of the food industry		2	ACFP
Food quality systems		3	ACFP
New products development		3	ACFP
Professionalizing elective	Topics on diagnostic microbiology	3 3 3 3 3	ACFP III ACFP IV ACFP V ACFP VI
	Predictive microbiology		
	Biophysics		
	Management and marketing of food of animal origin		
	Management and marketing of food of plan origin		
	Food technology of animal origin		
	Food technology of plant origin		
Professionalizing elective	Emotional intelligence and profession	2	ACFP VII
	Emulsion technologies		
	Total	**22**	

NINTH SEMESTER		Credits	Structure
Professional social ethics		2	ACFGU
Professionalizing elective	Plant biotechnology	4	ACFP VIII
	Molecular diagnostic		
Social service		16	SS
	Total	**22**	

TENTH SEMESTER		Credits	Structure
Elective	The undergraduate research thesis	22	ACLE
	Student exchange or mobility		
	Internships		
	Total	**22**	

According to [the Self-Assessment Report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Genomic Biotechnology:

"The educational program trains highly qualified professionals to provide to a society services and conditions necessary for a dignifying life, by

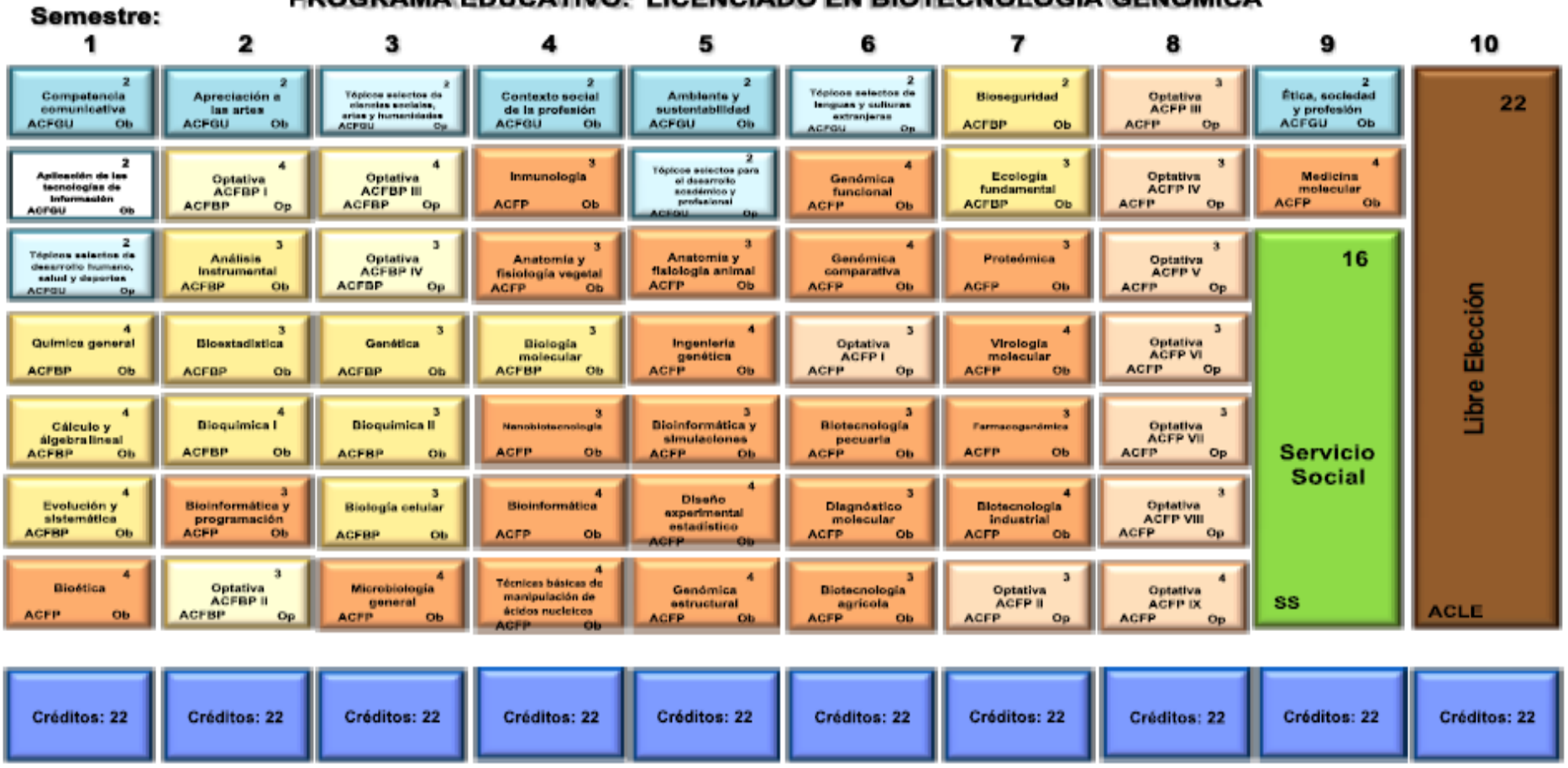
- Gaining knowledge in the validation and verification of molecular diagnostic procedures for their use in clinical (health), livestock, agricultural, aquacultural industrial and environmental sectors.
- Developing scientific research in its basic and applied forms, considering innovation and implementation of detection, modification and genomes selection strategies to develop biotechnological products and services.
- Promoting sustainable development, respect to nature and multiculturalism.

The Genomic Biotechnology Programme has been develop for its students throughout his or her progression to achieve three specific competences, which are:

- Develop molecular diagnostics, using knowledge of genomics and gene manipulation techniques, for health, agriculture, livestock and environmental applications.
- Design strategies for detection, modification and selection of genomes, using knowledge of genomics and gene manipulation techniques for the development of products, processes and services for the health biotech sector, agriculture, livestock , industrial and environmental.
- From the advances and discoveries of genomic sciences for the welfare of society: Develop products, processes and biotechnological services in the health, agriculture, livestock, industrial and environmental sectors."

The following **curriculum** is presented:

UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN
FACULTAD DE CIENCIAS BIOLÓGICAS
MALLA CURRICULAR
PROGRAMA EDUCATIVO: LICENCIADO EN BIOTECNOLOGÍA GENÓMICA



FIRST SEMESTER	Credits	Structure
Communication competencies	2	ACFGU
IT applications	2	ACFGU
Selected topics for Human Development, Health and Sports: Quality culture	2	ACFGU
General chemistry	4	ACFBP
Calculus and linear algebra	4	ACFBP
Evolution and systematic	4	ACFBP
Bioethics	4	ACFP
Total	**22**	

SECOND SEMESTER			
Selected topics for social sciences, arts and humanities: Art appreciation		2	ACFGU
Instrumental analysis		3	ACFBP
Biostatistics		3	ACFBP
Biochemistry I		4	ACFBP
Bioinformatics and programming		3	ACFP
Basic professional elective	Lab management	4	ACFBP I
	Intermediate English		
Basic professional elective	Quality management	3	ACFBP II
	Metrology and validation		
Total		**22**	

THIRD SEMESTER			
Selected topics of social sciences, arts, and humanity: alternative dispute resolutions		2	ACFGU
Genetics		3	ACFBP
Biochemistry II		3	ACFBP
Cell biology		3	ACFBP
General microbiology		4	ACFP
Basic professional elective	Topics on microbiology diagnostic	4	ACFBP III
	Advanced english		
Basic professional elective	Biophysics	3	ACFBP IV
	Physic chemistry		
Total		**22**	

FOURTH SEMESTER		
Professional socialization	2	ACFGU
Immunology	3	ACFP
Plan anatomy and physiology	3	ACFP
Molecular biology	3	ACFBP
Nano biotechnology	3	ACFP
Bioinformatics	4	ACFP
Basic techniques on nucleic acid manipulation	4	ACFP
Total	**22**	

FIFTH SEMESTER			
Environment and sustainability		2	ACFGU
Selected topics for academic and professional development: the scientific method		2	ACFGU
Animal anatomy and physiology		3	ACFP
Genetic engineering		4	ACFP
Bioinformatics and simulations		3	ACFP
Experimental design		4	ACFP
Structural genomics		4	ACFP
	Total	**22**	

SIXTH SEMESTER			
Selected topics for foreign culture and languages: English culture		2	ACFGU
Functional genomics		4	ACFP
Comparative genomics		2	ACFP
Livestock biotechnology		3	ACFP
Molecular diagnosis		3	ACFP
Agricultural biotechnology		3	ACFP
Professionalizing elective	selective topics on microbiology	3	ACFP I
	Genome sequence and score		
	Total	**22**	

SEVENTH SEMESTER			
Bio safety		2	ACFBP
Fundamental ecology		3	ACFBP
Proteomics		3	ACFP
Molecular virology		4	ACFP
Pharma genomics		3	ACFP
Industrial biotechnology		4	ACFP
Professionalizing elective	systems biology	3	ACFP II
	Bioremediation		
	Total	**22**	

EIGHTH SEMESTER			
Professionalizing elective	environmental biotechnology	3	ACFP III
	Germplasms design and conservation		
Professionalizing elective	proteins structure and engineering	3	ACFP IV
	Animal genetics		
Professionalizing elective	plant genome and biotechnology	3	ACFP V
	Genomic therapy		
Professionalizing elective	tissue cloning and therapy	3	ACFP VI
	Micro propagation		
Professionalizing elective	development and technology transfer	3	ACFP VII
	Metabolic engineering		
Professionalizing elective	molecular evolution and systematics	3	ACFP VIII
	Transgenesis and animal cloning		
Professionalizing elective	bioprocesse	4	ACFP IX
	Synthetic biology		
	Total	**22**	

NINTH SEMESTER		
Professional social ethics	2	ACFGU
Molecular medicine	4	ACFP
Social service	16	SS
Total	**22**	

TENTH SEMESTER			
Elective	The undergraduate research thesis	22	ACLE
	Student exchange or mobility		
	Internships		