ASIIN Seal & EQAS-Food Label

Accreditation Report

Bachelor's Degree Programme
Food Technology

Provided by
Agricultural University Bogor (IPB), Indonesia

Version: 22.09.2023

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A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Teknologi Pangan	Food Technology Study Program (FTSP)	ASIIN	Ban-Pt, Grade A, 2020-2025	08
Date of the contract: 24.02.2022 **Submission of the final version of the self-assessment report:** 03.03.2023 **Date of the onsite visit:** 08.-09.05.2023 **at:** IPB Bogor				
Peer panel: Prof. Dr. Gerhard Schleining, University of Natural Resources and Life Sciences, Vienna Dr. Knut Franke Leibniz University, Hannover Yehezkiel Allen Santoso, Student at Universitas Diponegoro Arum Tiyas Suminar, Kamada Soy Sauce Inc.				
Representatives of the ASIIN headquarter: Daniel Seegers				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: ASIIN General Criteria, as of April 14, 2022 Subject-Specific Criteria of Technical Committee 08 – Agriculture, Nutritional Sciences and Landscape Architecture as of March 27, 2015				

[1] ASIIN Seal for degree programmes
[2] TC: Technical Committee for the following subject areas: TC 08 - Agriculture, Nutritional Sciences and Landscape Architecture

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
Food Technology	Sarjana Teknologi Pangan / B.Sc. in Food Technology	/	6	Full time	/	8 Semesters	144 SKS 216 ECTS	Once a year in July/August 1981

For the Bachelor's degree Food Technology Study Programme (FTSP), the institution has presented the following profile on its website:

Vision
The Department of Food Science and Technology – IPB has the vision to become an excellent institution of food science and technology at the global level in the field of tropical bioscience.

Missions
The missions of the Department are as follows:

1. Hold high-quality undergraduate, master and doctoral programmes in the field of food science and technology to produce competent and globally competitive graduates

2. Hold research contributing to the development of food science and technology with excellence in the field of tropical biosciences, which can be applied in the community and the food industry.

3. Hold community service activities to provide solutions to problems and challenges in the community

Objectives
To achieve its vision and carry out the missions, the Department has the following objectives:

1. Produce competent and globally competitive graduates at all programme levels.

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

2. Produce basic and applied research to support national food policy, development of the food industry, and advances in the field of food science and technology with excellence in the field of tropical biosciences.

3. Apply food science and technology through community service activities in providing solutions to problems and challenges in society

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Objective-module matrices
- Self-Assessment Report
- Study plans of the degree programmes
- Curriculum handbook
- Module descriptions
- Website
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts refer to the Subject Specific Criteria (SSC) of the Technical Committee Agriculture, Nutritional Sciences and Landscape Architecture (TC 08) as a basis for assessing whether the intended learning outcomes of the Bachelor of Science in Food Technology Study Program (FTSP), as defined by the Institute Pertanian Bogor (IPB), correspond to the competences as outlined in the SSC. They come to the following conclusion:

The qualification objectives of the FTSP programme aim to develop graduates who possess the necessary skills to apply food science and technology principles in the processing of food materials, ensuring the production of safe, high-quality, and nutritious food products and beverages on an industrial scale. To achieve this, students receive a comprehensive education in the fundamental sciences that serve as the building blocks of food science, including chemistry, biochemistry, biology, physics, mathematics, calculus, and statistics.

Upon completion of the programme, graduates are equipped to pursue diverse roles within the food industry. These roles encompass production planning and inventory control, production management, new product development, food quality assurance and control, regulatory compliance, warehousing, purchasing/procurement, as well as sales and marketing. Beyond the industrial sector, FTSP graduates can also pursue opportunities in research, education, financial institutions, and government agencies.

The qualification objectives of the FTSP programme are designed to align with international standards. The programme has already undergone a successful evaluation according to the IFT (Institute of Food Technologists) standards and is now being subjected to the criteria of the EQAS-Food Awards. Upon a thorough examination of the submitted documents and based on the discussions held during the audit, the experts conclude that the programme also meets the criteria set by IFA (ISEKI-Food Association) and therefore justifies the award of the corresponding seal.

The FTSP programme covers the criteria areas outlined by IFA to a percentace of more than 80%, including food safety and microbiology, food chemistry and analysis, food processing and engineering, quality management and the law, as well as generic competences. These criteria areas ensure that students acquire knowledge and skills in ensuring the safety of food products, understanding food chemistry principles, utilizing analytical techniques for food analysis, optimizing food processing and engineering techniques, adhering to quality management practices and legal standards, and developing generic competences such as critical thinking, problem-solving, teamwork, communication, and ethical decision-making.

By incorporating the criteria set by IFA into the curriculum, the FTSP programme ensures that graduates are well-prepared to meet international standards in the field of food science and technology.

In summary, the auditors are of the opinion that the objectives and intended learning outcomes of the FTSP programme are reasonable and well founded and correspond to level 6 of the European Qualification Framework. They are convinced that the intended qualification of the undergraduate programme will enable students to take up a job appropriate to their qualification. They also learn that various stakeholders (alumni, industry and government representatives) are involved in the continuous review and development of the curriculum. For example, industry representatives are regularly invited to give suggestions on the skills and expertise graduates must possess and which new materials or topics should be added to the curriculum. While there is a national standard for curriculum design, IPB takes into account stakeholder feedback and incorporates their expertise by supplementing lectures with guest lecturers from the industry who address emerging issues.

This cooperation between IPB and, in particular, its industrial partners results in good chances for the graduates on the national job markets, as well as the opportunity to transfer to other academic programmes to complete a Master's or maybe even a PhD programme. Although the programme is mainly aimed at the national market, the auditors noted that the students participating in both the regular and international programmes had a very high level of proficiency in English, which was very impressive.

The employers confirm during the audit discussions that there is a high demand for Food Technology graduates. Furthermore, they emphasize that graduates from IPB University are their first choice because they are "quick learners" and able to adapt very quickly to the specific situations, bring new ideas and energy, are able to solve problems and could be a motor for SMEs. Nevertheless, the industry representatives also underline that there is room for improvement regarding Engineering aspects and process design as well as for the entrepreneurial skills of the students, especially for basic financing knowledge. The experts recommend strengthening these competences within the FTSP programme to better prepare graduates for the dynamic and innovative challenges of the food industry.

Overall, the FTSP programme aims to produce well-rounded professionals who are prepared to contribute to various sectors of the food industry while also having the flexibility to explore career opportunities outside of it.

Criterion 1.2 Name of the degree programmes

Evidence:

- Self-Assessment Report
- Diploma Supplements
- Discussions during the audit
- List of laboratory equipment

Preliminary assessment and analysis of the experts:
The auditors confirm that the English translation and the original Indonesian names of the Bachelor's degree programme Food Technology correspond with the intended aims and learning outcomes as well as the main course language.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plan of the degree programme
- Curriculum handbook
- Academic guidelines
- Module descriptions
- Objective-module matrices
- Discussions during the audit

Preliminary assessment and analysis of the experts:
After analysing the module descriptions and the curriculum, the experts confirm that the FTSP is divided into modules and that each module is a sum of coherent teaching and learning units. All working practice intervals (community service and field training) are well integrated into the curriculum, and the supervision by the faculty allows for their respective quality in terms of relevance, content, and structure. In addition, the experts gain the impression that the choice of modules and the structure of the curriculum ensure that the intended learning outcomes can be achieved.

The curriculum consists of eight semesters, with a total of 144 credits, equivalent to 216 ECTS (European Credit Transfer and Accumulation System) credits. The programme offers a comprehensive range of courses covering various aspects of food science and technology.

At the beginning of the study programme, students are introduced to a range of foundational subjects such as religion, innovative agriculture, economy, English, chemistry, sociology, mathematics, and statistics. These courses establish a strong base of knowledge and help students develop a solid understanding of the fundamental principles in food science.

As students advance through the programme, the courses become more focused and specific, allowing them to delve deeper into the intricacies of the field. They explore subjects like organic chemistry, food chemistry, microbiology, food engineering, and sensory evaluation. Practical laboratory work is incorporated into the curriculum, enabling students to gain hands-on experience in areas such as food analysis, food safety, and food manufacturing technology.

In the later stages of the programme, the curriculum further narrows its focus, delving into advanced areas of food science and technology. Students study specialized subjects like food packaging and storage technology, food additives, food quality assurance, and biological evaluation of food components. They also engage in professional development activities and undertake a final year project, which may involve research or an internship. These

experiences provide students with the opportunity to apply their knowledge in real-world settings and further refine their expertise.

By the end of the programme, students have acquired a specialized understanding of various aspects of food science and technology. They are equipped with both theoretical knowledge and practical skills, enabling them to tackle complex challenges in the food industry. The curriculum's progression from foundational to specialized knowledge ensures that students are well-prepared for successful careers in the field of food science and technology.

Students are usually required to do community service in their final year. Programme coordinators explain that community service is compulsory for all Indonesian students. It lasts a minimum of four weeks and usually takes place in villages or rural areas where students stay and live with the local people. The course is designed to enable students to apply their knowledge in their field of study in order to empower society. During the audit, the experts learn that the students work on concrete tasks/contents in coordination with their supervisors and that they are well supervised in the process. The evaluation of the community service consists of a work plan, the implementation of the programme and an activity report.

Internships are usually conducted during the semester breaks and students are responsible for finding suitable work placements. Internships are often unpaid for the first three months, but there is often the possibility of extending them on a contractual basis, leading to paid positions.

The curriculum is regularly reviewed according to the Standard Operational Procedure (SOP) and feedback is received from various stakeholders, including students, lecturers, alumni and private sector partners. While minor changes are made on an ongoing basis, the curriculum is revised and reviewed in more detail every five years. It is also aligned with, the Indonesian National Qualifications Framework and industry recommendations. The curriculum effectively addresses the needs of IPB's stakeholders and Indonesian society.

As part of the K2020 curriculum redesign, significant changes have been implemented to meet the requirements of stakeholders and IFT accreditation. The revised curriculum emphasises the development of students' communication and collaboration skills, critical thinking and creativity in both general and specialised food science modules.

The department has successfully implemented student-centred learning and participatory teaching methods in various modules. A notable example is the Food Innovation module (TPN1305), which incorporates practical work in industrial management, food processing,

food analysis, food quality assurance, food safety systems, food business and marketing. Feedback from both students and teachers on this module has been overwhelmingly positive, with the workload perceived to be reasonable based on calculations.

The programme provides many opportunities to develop communication skills in English, which are becoming increasingly important in this age of globalisation. As IPB aims to further internationalise its programmes, the programme coordinators explained that students are divided into 4 classes, 2 of which are so-called "international classes", taught entirely in English. International classes are attended by both incoming and Indonesian students. In addition, most of the teaching materials (power point slides) for the Bahasa (Indonesian) language classes are also provided in English. Information about the curriculum is available to students in an online system.

Both students and representatives of industry and public institutions are satisfied with the overall composition of the curriculum. However, as stated in Criterion 1.1, industry representatives would like to see more engineering and process design aspects, as well as entrepreneurial skills, especially in basic finance. The experts recommend strengthening these competences within the FTSP programme in order to better prepare graduates for the dynamic and innovative challenges of the food industry.

Overall, the experts are satisfied with the curriculum. They see that the programmes are well-structured and that the modules build on each other in a reasonable way, enabling the students to effectively reach the learning outcomes as laid down for the programme.

Mobility

From the discussion with the programme coordinators, the experts understand that students cannot choose elective modules in Food Technology due to national regulations, but they can choose courses from other programmes offered by IPB. However, they learn that through the Merdeka Belajar-Kampus Merdeka (MBKM) programme, students can choose and specialise in courses at other universities both abroad and in national universities.

Since 2020, the MBKM programme provides students with the opportunity to earn up to 40 SCU (equivalent to 2 semesters) outside the university, and up to 20 SCU (equivalent to 1 semester) outside the field of Food Technology. This programme offers various possibilities for students, including internships in industry, research, independent projects, student exchanges, teaching assistance in education units, entrepreneurship, building a village, and humanitarian projects.

The MBKM-programme is optional for students. They are required to consult with their academic supervisor to determine their relevant part of the MBKM programme and fill out

a Learning Agreement accordingly. The number of credit points students can earn by participating in one of the activities in the MBKM programme for a single semester depends on their workload.

There are two options for participation in the MBKM programme: full-time and part-time. Full-time participation involves leaving the campus for one semester without attending regular lectures, while part-time participation allows students to utilize their spare time between academic activities on campus.

A notable aspect of the programme, as recognised by the expert group, is its remarkable emphasis on international mobility. In 2022, the FTSP successfully sent 57 students to various destinations around the world. Students are actively encouraged to take part in summer courses, enrol for individual courses or entire semesters, and attend conferences at universities abroad. This global exposure is complemented by the faculty members' extensive international networks and diverse educational backgrounds.

The reviewers were informed that IPB University has established numerous international partnerships and developed a scholarship programme. In addition, the university offers scholarships to foreign students who wish to study at IPB. Universities involved in student exchange programmes include Kangwon National University in the Republic of Korea, Kookmin National University in the Republic of Korea, Tokyo University of Agriculture in Japan, the Faculty of Forestry at the University of British Columbia in Canada, Universiti Putra Malaysia in Malaysia, the University of Göttingen in Germany, and the Faculty of Agriculture at Kasetsart University in Thailand.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Academic Guidelines
- Websites
- Discussions during the audit

Preliminary assessment and analysis of the experts:
According to the Self-Assessment Report, the admission procedure is carried out centrally by the Directorate of Educational Administration. The requirements, the schedule and the registration venue are announced on the University’s webpage and published in form of a Guidance Book as well. Therefore, the admission system is accessible for all stakeholders.

There are three main schemes by which students can be admitted to a Bachelor's programme at IPB:

1. National Entrance Selection of State Universities (Seleksi Nasional Perguruan Tinggi Negeri, SNMPTN), a national admission system, which is based on the academic performance during the high school (averagely, 33.8 % of the students are admitted through this selection system).

2. Joint Entrance Selection of State Universities (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN). This national selection test is held every year for university candidates. It is a nationwide written test (subjects: mathematics, Bahasa Indonesia, English, physics, chemistry, biology, economics, history, sociology, and geography). It accounts for 29.4 % of the admitted students).

3. Admission based on Talent Test (*Ujian Talenta Masuk IPB* - UTM). Written test conducted by IPB (around 15 % of the students are admitted through this test).

In addition to the conventional admission routes, the Food Science and Technology Department offers alternative pathways for admission, including those based on international achievements or regional representative scholarships, which account for a smaller portion of the overall admission process. One notable pathway is through a written English Exam specifically designed for applicants seeking admission to the international classes offered by the department. This exam serves as a specialized assessment of English proficiency and suitability for the programme, ensuring that students admitted to the international classes are well-prepared to excel in an English-speaking academic environment.

IPB University presents the number of applicants as well as the number of accepted students for the FTSP. It can be observed that the number of applicants far exceeds the number of available places. Of the 2310 applicants, only 6% were accepted for the 150 places (130 regular classes, 20 international classes).

The experts inquire of the programme coordinators why there are so many students applying for studying at IPB. They learn that the offered programme is very popular subject because the job perspectives are very good. In addition, there are many high school graduates in Indonesia and IPB is one of the most prestigious universities in the country. Consequently, IPB is able to only accept the very best candidates.

The admission website informs potential students in great detail about the requirements and the necessary steps to apply for admission into the programmes. Since the rules are based on decrees by the ministry of education and on the university's written regulations, the experts deem them binding and transparent.

Criterion 1.5 Workload and Credits

Evidence:

- Self-Assessment Report
- Study plan of the degree programme
- Curriculum handbook
- Survey of student satisfaction related to the workload
- Module descriptions
- Discussions during the audit
- Students handbook

Preliminary assessment and analysis of the experts:

Based on the National Higher Education policy, the FTSP uses a credit point system called SKS. In comparison to ECTS credit system, wherein 1 ECTS equals 25-30 hours of students' workload per semester, it is determined that 1 SKS is awarded for 170 minutes of workload per week and the relation between the different kind of learning (contact hours, self-studies) is fixed. Most of the modules are rather small and encompass between 1 and 3 SKS. A standard 3 SKS module approximately equals 4 ECTS. Therefore, to reach the usual workload, students need to take on average 18 SKS per semester. However, the regular schedule usually covers 19-21 SKS per semester to give more space in the last semesters for final projects, or more electives. If a student is not satisfied with his GPA, she or he can repeat the classes, but this will lead to a prolongation of the study time.

The module handbook uses a credit code that indicates the distribution of lecture and laboratory work. For example, the code 3(2-1) indicates that 2 credits are awarded for lecture and 1 credit for laboratory work. Modules may be purely lecture and purely laboratory modules or a mixture of the two.

According to the Self-Assessment Report, the expected time to complete the programme is 8 semesters. The average length of study is slightly longer than 8 semesters. A number of corrective measures have already been taken to compensate for this slight delay, which is mainly due to the implementation of the final year project. However, the impact of these corrective measures can only be assessed when the restrictions imposed by Covid 19 no longer affect the study. The experts appreciate these efforts.

Overall, the experts have the impression that the workload of the FTSP is generally appropriate and that the modules are adequately credited. This impression is confirmed by the students during the audit.

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

- Photos and videos of laboratories
- Self-Assessment Report
- Module descriptions
- Samples of lecturer evaluation by students
- Websites
- Discussions during the audit

Preliminary assessment and analysis of the experts:

IPB University aims to support the transition from teacher-centred to student-centred teaching in order to involve all students in the learning process and to develop their thinking and analytical skills. Among other methods, blended learning is being introduced as a modern way of teaching. The use of e-learning elements in the learning process allows for classroom activity without physical presence. In this respect, IPB's Lecture Management System and other internet resources are actively used to provide students with course materials. In order to support and guide teachers in the use of these tools, all members of the teaching staff have attended workshops on blended learning.

The FTSP uses several different teaching methods for each course, such as practical laboratory work, field studies, lectures, community service and the final research project.

Active and interactive teaching methods (e.g., lectures, discussions, reports, presentations and group work) are used in the classroom. IPB aims to encourage students to acquire knowledge from different scientific fields and to introduce them to research activities. This should ultimately contribute to the transition from a teacher-centred to a student-centred approach to learning.

In addition, with the 2020 curriculum, IPB has tried to implement teaching methods that better prepare students for their working lives and are closer to the expected cases they will be working on. Therefore, they added problem-based learning to strengthen students' communication and collaboration skills, critical thinking and creativity.

In summary, the expert group judges that the teaching methods and tools are appropriate to support students in achieving the intended learning outcomes. In addition, they confirm

that the study design of the FTSP includes a variety of teaching and learning methods and practical parts, adapted to the respective subject culture and study format. Students are actively involved in the design of teaching and learning processes (student-centred teaching and learning).

Another tool IPB uses to improve the diversity of teaching and learning is the invitation of guest lecturers from the industry or alumni who are able to convey practical experiences and present examples of how the contents of the study programme are applied in practice. The experts welcome this approach and recommend deepening the efforts since they could learn during the discussion with the industry representatives that this exchange is highly valued by them and that all parties benefit from the opportunity to cooperate.

During the discussions with the programme coordinators and the teaching staff, the experts learn that the teaching staff tries to implement English assignments such as presentations and written homework to support the English language proficiency of the students. Some of the face-to-face teaching is also held in English depending on the lecturer.

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

IPB does not comment on the content of the chapters.

The experts consider criterion 1 **fulfilled.**

2. Exams: System, Concept and Organisation

Criterion 2 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Module descriptions
- Examination regulations
- Curriculum handbook
- Samples of student's work (projects, exams and thesis)
- Statistical data
- Websites
- Academic Calendar

Preliminary assessment and analysis of the experts:

According to the Self-Assessment Report, the students' academic performance is evaluated based on their attendance and participation in class, their laboratory works, assignment reports, homework, presentations, mid-term exam, and the final exam at the end of each semester. The system, concept, and organization of exams are stated in the Guidance Book of Bachelor Degree Programmes of the University, which is available to the students and faculty members in printed and electronic forms. Everyone can access the Guidance Book via website of the University also. All final exams take place within a certain timeframe at the end of each semester. This timeframe (exam weeks) is communicated at the beginning of each academic year. Before the exam week there is a preparatory week offered for students to prepare intensively for their final exams.

If a student fails, he or she must take a remedial exam in order to pass the courses or repeat the entire module in the following semesters. The further details are described the Academic Guidelines.

The experts discussed also the availability of special measures for students with disabilities or illnesses when examinations take place. They learn that IPB University has regulations for disability compensation, which include the extending deadlines, leave of absence (one semester break), alternatives examination forms.

In addition to the course assessments, undergraduate students are required to complete a final project in the form of a bachelor's thesis. The final year student fulfilling the academic performance requirements is admitted to the final stage consisting of the following items: preparation phase (proposal drafting), research implementation, writing the thesis, seminar (presentation of preliminary findings), and thesis exam. In the preparation phase, students need to prepare and submit a research proposal including a suitable topic to the Thesis Advisory Committee. The Committee reviews the proposal and decides about the supervisor, who mentors the student until the final report submitted and presented. Assessment of the thesis exam is conducted by a supervisor, an examiner, and a chairperson of the degree examination session.

The experts also inspect a sample of examination papers and final theses and are overall satisfied with the general quality of the samples.

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

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

IPB does not comment on the content of the chapter.

The experts consider criterion 2 **fulfilled.**

3. Resources

Criterion 3.1 Staff and Staff Development

Evidence:

- Self-Assessment Report
- Staff Handbook
- Samples of lecturer evaluation by students
- Study plan of the degree programme
- Module descriptions
- Websites
- Discussions during the audit

Preliminary assessment and analysis of the experts:
At IPB, the staff members have different academic positions. There are professors, associate professors, assistant professors, lecturers, and assistant lecturers. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. For example, a full professor needs to hold a PhD degree. In addition, the responsibilities and tasks of a staff member with respect to teaching, research, and supervision depend on the academic position. According to the Self-Assessment Report, the structure of the teaching staff is as follows: 17 professors, 12 associate professors, 6 assistant professors and 5 lecturers.

The experts discuss with IPB's management how new staff members are recruited. They learn that every year the faculties and departments announce their vacancies to the University's management. Since IPB is semi-autonomous, they can decide themselves what staff members to hire.

The experts also inquire whether there are any requirements for staff members to hold practical experience when applying to IPB. During discussions with the University's man-

agement, it is clarified that practical experience has importance for the academic staff, particularly for those practitioners involved in teaching in vocational schools. As regards the faculty, staff positions are mostly taken by PhD degree holders. Therefore, the requirements mainly addressed the scientific profile with the capability to apply theory in the field of research.

The auditors are impressed at how the staff members and programme coordinators are engaged to the process, and certainly, this atmosphere of understanding and support is one of the strong points of the degree programme.

In summary, the experts confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programme.

In order to encourage the training of its academic and technical staff, IPB University has developed a programme for improving the didactic abilities and teaching methods. One part of the capacity-building programme focuses on subject-specific skills (to keep up with current developments and trends in the areas of the programmes under review), whereas other training courses are intended to further improve the teachers' didactic skills and to introduce new teaching methods (e.g., blended learning, project based learning).

The professional and scientific development of the staff members is coordinated both at the University and faculties level. There are financial resources available for staff members to go abroad for a limited time and to take part at conferences or other events in order to stay up to date with the scientific development in their area of expertise. In addition, all three faculties want to promote the process of internationalisation at IPB by hosting international scientific events, facilitating sabbatical leaves, and inviting international professors.

The experts 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 IPB University, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops or seminars.

While there are sufficient opportunities for teachers to develop their skills, the experts recommend that pedagogical training should be made compulsory for new teachers to ensure that they are equipped with the necessary tools and techniques to deliver effective teaching in the classroom.

Additionally, the experts pay attention to the scientific research that is funded by the industry, and to what extent the students can take part in such activities together with the lecturers. In this regard, programme coordinators and lecturers alike refer to examples of

research projects IPB carries out in cooperation with the industry. According to the University, the purpose of such collaborations is to implement innovations currently needed by the industry, and to form industrial atmosphere at the campus as well. In order to strengthen the bridge between science and industry, a Science-Techno Park has been developed at the campus.

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

Criterion 3.2 Student Support and Student Services

Evidence:

- Self-Assessment Report
- Curriculum handbook
- Students handbook
- Discussions during the audit

Preliminary assessment and analysis of the experts:
IPB University offers a comprehensive advisory system for all undergraduate students. At the start of the first semester, the academic supervisors are assigned to students. The role of the academic supervisor is to help the students with the process of orientation during the first semester, 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 experts that they all have an academic advisor.

The university has also implemented a mentoring system with the aim of fostering student development. The system brings numerous benefits, including promoting collaboration and a sense of community among faculty members, facilitating effective pedagogical practices, offering personalized support, and enabling experienced faculty members to contribute to the professional growth of their experts. This initiative reflects the university's dedication to enhancing the quality of education and creating a supportive learning environment for students.

In conjunction with the academic and mental support, University provides financial support for students with economic difficulties. In addition, the University manages and distributes scholarships to assist students with high academic performance.

The University also provides student counselling services and medical center services for personal problems a student might face. Students' interests and talents are furthermore facilitated through several centers, such as the career development center or the scholarship information portal. In order to provide students with sufficient information about the available support and assistance, IPB distributes a Guidance Book for Bachelor's degree students that is regularly updated. All necessary information can also be found on IPBs websites.

The experts 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.

Criterion 3.3 Funds and equipment

Evidence:

- List of laboratories and equipment
- Photos and videos of the facilities
- Partnership agreements
- Recapitulation of budget
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the experts:
Basic funding of the degree programmes and the facilities is provided by the IPB University. Additional funds, e.g. for research activities or special equipment, can be provided by IPB or by the National Indonesian Government, but the teachers have to apply for them.

During the audit, the experts were shown advanced research laboratories with modern equipment (e.g., rheometer, texture analyser, confocal laser scanning microscope, PCR for genetic sequencing, GC and HPLC with mass spectroscopy). These laboratories are supported by technicians and are available for use by research staff and graduate students. In contrast to these research labs, the labs used for undergraduate training are at a more

basic level. In addition, a pilot plant equipped for multiple unit operations in food processing could be visited, as well as a very modern science park used as an innovation incubator, equipped with an automated filling station for liquid products, where e.g. bottled water is produced on a regular basis and which is also used for scaling up experiments of innovations.

The experts are satisfied that the teaching and office facilities, libraries and computer labs which are adequate for all students and staff. The experts can also assess that safety measures, such as safety policies and protocols, fire extinguishers and emergency showers, are available and in line with international guidelines. Students are also required to undergo safety training in order to work in the laboratories.

However, an important recommendation for the university is to ensure that students have access to international literature resources, particularly journals. Access to such resources is crucial in fostering a comprehensive and globally informed learning environment. To address this, the university should consider expanding its library collection and online databases to include a wide range of international journals. By providing students with access to these resources, the university will enable them to engage with diverse perspectives and stay up-to-date with current research and developments from around the world. This recommendation aligns with the university's commitment to offering a high-quality education that prepares students for success in a globalized society.

During the visit, the faculty acknowledged the need to improve the accessibility of its buildings. As part of this commitment, the university administration has announced plans to make the necessary modifications to ensure better accessibility for individuals with disabilities. Notably, one of the key initiatives scheduled for the upcoming year is the construction of an elevator. This addition will greatly enhance the mobility and convenience for students, faculty, and staff with disabilities, allowing them to navigate the campus more easily. The university's dedication to creating an inclusive environment through the implementation of these accessibility measures is commendable and aligns with the principles of equal opportunity and inclusivity.

In summary, the experts confirm that current funding allows standards to be maintained and additional instrumentation to be purchased if required, that IPB University generally has sufficient workspace and laboratories, and that all laboratories are equipped with modern and sophisticated instrumentation.

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

Criterion 3.1

IPB is actively considering the recommendation to make pedagogical training compulsory for new lecturers. The experts highly appreciate this thoughtful consideration.

Criterion 3.3

IPB subscribes to several international journals related to food science/technology and is constantly striving to increase its students' access to even more international journals. The reviewers encourage IPB to continue these efforts.

The experts consider criterion 3 **fulfilled**.

4. Transparency and documentation

Criterion 4.1 Module descriptions

Evidence:

- Module descriptions
- Websites

Preliminary assessment and analysis of the experts:
The students, as well as all other stakeholders, have access to the module descriptions via IPB's homepage. The more detailed syllabus is handed out to the students by the lecturers at the beginning of each semester. The syllabus includes a practical guideline and detailed description of the practical parts of each course.

After reviewing the module descriptions, the experts confirmed that they contain all the essential details, including information on the module coordinators, teaching methods, workload, credit points awarded, intended learning outcomes, content coverage, applicability, admission and examination requirements, as well as assessment methods and a comprehensive explanation of how the final grade is calculated. However, one crucial piece of information that is currently missing is the allocation of ECTS credits to individual courses. This information needs to be included for greater clarity and transparency of the workload.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Sample Transcript of Records

- Sample Diploma certificate
- Sample Diploma Supplement

Preliminary assessment and analysis of the experts:
The experts confirm that FTSP students receive a diploma and a diploma supplement upon graduation. The diploma consists of a diploma certificate and a transcript of records. The transcript of records lists all the courses taken by the graduate, the credits earned, the grades and the cumulative GPA. The Diploma Supplement contains information about the degree programme, including soft skills acquired and awards (extra-curricular and co-curricular activities). However, it does not currently provide information on the grade distribution within the student cohort and the ECTS credits earned, which is necessary for potential employers to be able to properly assess a student's performance. Therefore, IPB has to add this statistical information.

Criterion 4.3 Relevant rules

Evidence:

- Self-Assessment Reports
- Curriculum handbooks for all degree programmes
- Academic Guidelines
- Examination regulations
- All relevant regulations as published on the university's website

Preliminary assessment and analysis of the experts:
The auditors confirm that the rights and duties of both IPB and the students are clearly defined and binding. All rules and regulations are published on the university's website and hence available to all relevant stakeholders. In addition, the students receive all relevant course material in the language of the degree programme at the beginning of each semester.

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

Criterion 4.1 & 4.2

IPB provides updated module handbooks and a comprehensive diploma supplement, both containing all the necessary information.

The experts consider criterion 4 **fulfilled.**

5. Quality management: quality assessment and development

Criterion 5 Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts learn that there are two levels of quality assurance. The first level is external quality assurance, which consists of an external review of IPB's study programmes by the National Higher Education Accreditation Body (BAN-PT). The FTSP received an "A", which means "Unggul (Excellent)" in the new BAN-PT rating. The second level consists of an internal quality assurance system carried out by different actors.

The first actor at the university level is the Quality Management and Internal Audit Office (KMMAI). Its role is to develop and monitor the university's quality assurance system in order to continuously improve the quality and accountability of academic and non-academic programmes throughout the university. It follows a Plan-Do-Check-Action (PDCA) cycle.

At faculty level, IPB has established Quality Assurance Groups (Gugus Penjamin Mutu, GPM) that work in close collaboration with the Quality Control Units (Gugus Penjamin Mutu, GPM) at departmental level. While the Vice-Dean coordinates the GPMs, the Secretary of the Department coordinates the GKMs.

IPB University presents the published document “Quality Assurance System for undergraduate programmes (IQAS(/SPMI(Internal Quality Assurance System))”, complying with the University’s Education Quality Standards for Education. The regulations encompass all core processes of the University and the respective quality assurances measures, processes and responsibilities. All of the mentioned quality assurance units on the different levels use this tool to work towards the same standard.

The IQAS mandates regular monitoring, assessment, and audit of quality achievement, involving students, alumni, and graduate users. Students are involved in assessing the learning process, while alumni and graduate users evaluate the outcomes of graduates through

tracer studies. There are seven quality standards for BSc degree programmes at IPB University, covering various aspects of education and research:

1. Standard-1: Vision, Mission, Objectives, and Targets, as well as Strategic Programmes. This standard ensures that the vision, mission, objectives, and targets of the BSc degree programmes are well-defined and aligned with the overall goals of IPB University. It also includes strategic programes to support the achievement of these objectives.
2. Standard-2: Government, Leadership, Management, and Quality Assurance Systems. This standard focuses on the governance structure, leadership, and management of the BSc degree programmes. It ensures that effective systems for quality assurance are in place to maintain educational standards.
3. Standard-3: Students and Graduates. Standard-3 emphasizes the well-being and success of students throughout their academic journey. It includes aspects such as student support services, student development, and the overall satisfaction and performance of graduates.
4. Standard-4: Human Resources. This standard addresses the quality and competence of faculty members and staff involved in delivering the BSc degree programmes. It includes aspects such as recruitment, professional development, and the evaluation of teaching staff.
5. Standard-5: Curriculum, Learning Process, and Academic Atmosphere. Standard-5 focuses on the curriculum design, the learning process, and the overall academic environment offered to students. It ensures that the curriculum is relevant, the teaching methods are effective, and the academic atmosphere is conducive to learning.
6. Standard-6: Funding, Infrastructure, and Information Systems. This standard covers the availability of adequate funding, infrastructure, and information systems to support the delivery of BSc degree programmes. It ensures that the necessary resources are provided to facilitate effective teaching, research, and learning.
7. Standard-7: Research, Community Empowerment, and Collaboration. Standard-7 emphasises the importance of research, community engagement, and collaboration within the BSc degree programmes. It encourages research activities, partnerships with external stakeholders, and contributions to the development of the community.

Two important tools highlighted by IPB are the curriculum evaluation and development process and the evaluation of teaching and learning.

Curriculum evaluation aims to improve programmes and ensure relevance to current issues and developments. The evaluation process involves various stakeholders and takes place every five years. Feedback from alumni and stakeholders is used to adapt the curriculum. In 2014, the curriculum was enhanced by incorporating new courses such as KKNT (Knowledge, Skills, and Attitudes for Natural Resource Management) and Field Work. These additions provided students with more opportunities to learn independently in the field, interact with the community and engage in entrepreneurial activities. In addition, a new curriculum was introduced in 2020 with a focus on the demands of the Industrial Technology 4.0 era. This curriculum encouraged students to take enrichment courses of approximately 20 credits in total. These courses aimed to enhance students' competence through independent learning activities. In addition, the curriculum emphasised the development of students' character by offering various opportunities such as student exchanges, internships/field placements, teaching in schools, research projects, humanitarian initiatives, entrepreneurial activities, independent projects and village development projects. Overall, the 2014 and 2020 revisions aimed to improve the relevance of the curriculum, encourage student engagement and enhance the overall student learning experience.

The learning evaluation is completed online by students each semester. Ten elements of courses are evaluated, including course design, delivery of materials, knowledge acquisition, attendance, independent work, teaching materials, teaching facilities, examination questions and prompt notification of examination results. Quality assurance activities include planning, implementation, monitoring and evaluation with the aim of improving the teaching and learning process. Student satisfaction is assessed through the Evaluation of the Teaching and Learning Process (EPBM), which provides feedback on course parameters and lecturer performance. The EPBM results for all departments are consistently good, with no negative impact on student participation or feedback.

During the audit, the experts discuss the quality management system at IPB with the rectorate representatives, programme coordinators and the students. They concluded that IPB has established a well-organised system of quality assurance that involves all relevant stakeholders. All programmes and courses are constantly under review for further development. Students learning outcomes throughout the whole student life cycle are monitored through various surveys and the results are used to improve the quality of the degree programmes. In this regard, it is particularly noteworthy that the faculty seems to have succeeded in establishing a remarkably responsive feedback culture between teachers and students. During the discussions, students report that their assessment of the courses and their criticism of the work of University’ services are taken seriously and that they feel well

informed about the follow-up to any critical remarks. The lecturers also confirm the trusting and cooperative relationship in the teaching/learning community at the faculties. Moreover, IPB University and the Faculty of Agricultural Engineering and Technology maintain close contact with their alumni, who also support the Faculty by raising funds.

The experts learn from the representatives of IPB's partners from public institutions and private companies that there are regular meetings with the partners on faculty level, where they discuss the needs and requirements of the employers and possible changes to the degree programmes. The experts see that changes in the curriculum are implemented as a result of feedback from employers.

In summary, the expert group confirms that the quality management system is suitable to identify weaknesses and to improve the degree programme. All stakeholders are involved in the process.

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

IPB does not comment on the content of the chapter.

The peers consider criterion 5 **fulfilled.**

D Additional Documents

No additional documents needed.

E Comment of the Higher Education Institution (31.07.2023)

Responses to the Draft Report

Thank you so much for the feedback given to us during the site visit. There are several things that we have incorporated to our teaching-learning system in order to improve the quality of educational process at Food Technology Study Program (FTSP), Department of Food Science and Technology (DFST), IPB University. These include:

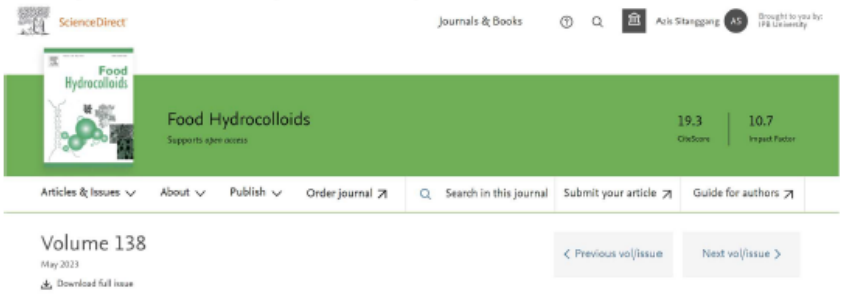
1. Provision of learning hours based on ECTS in our Module Handbook for each course offered.
2. Documentation of ECTS as well as the Learning Outcomes and the average GPA of the graduated student compared to the average students' GPA within that class (*i.e.*, clustering student's quartile performance).

In addition to this, we would like to address the draft of site visit report for each criterion as follows:

Criteria	Comments
Criterion 1.1 Objectives and learning outcomes of a degree program (intended qualifications profile)	Confirmed
Criterion 1.2 Name of the degree program	Confirmed
Criterion 1.3 Curriculum	Confirmed
Criterion 1.4 Admission requirements	Confirmed
Criterion 1.5 Workload and Credits	Confirmed

E Comment of the Higher Education Institution (31.07.2023)

Criteria	Comments
Criterion 1.6 Didactic and Teaching Methodology	*"Another tool UI uses to improve the diversity of teaching and learning is the invitation of guest lecturers……"* **Comm.:** Please change UI into IPB
Criterion 2 Exams: System, concept and organization	Confirmed
Criterion 3.1 Staff and Staff Development	*"…… the experts recommend that pedagogical training should be made compulsory for new teachers to ensure that they are equipped with the necessary tools and techniques to deliver effective teaching in the classroom"* **Comm.:** Yes, we will take this into consideration, to make it to be the policy of our study program, to have pedagogical training for our newly recruited lecturers.
Criterion 3.2 Student Support and Student Services	Confirmed
Criterion 3.3 Funds and equipment	*"However, an important recommendation for the university is to ensure that students have access to international literature resources, particularly journals. Access to such resources is crucial in fostering a comprehensive and globally informed learning environment.* ***To address this, the university should consider expanding its library collection and online data-bases to include a wide range of international journals.*** *By providing students with access to these resources, the university will enable them to engage with diverse perspectives and stay up-to-date with current research and developments from around the world. This recommendation aligns with the university's commitment to offering a high-quality education that prepares students for success in a globalized society…"*

Criteria	Comments
	Comm.: Thanks for this suggestion. In fact, our library subscribes for several international journals related to food science/technology that considered hybrid journals (through subscription and supports open access), such as (*examples*): • Food Hydrocolloids Journal (Science Direct)  • Food Chemistry Journal (Science Direct) 

E Comment of the Higher Education Institution (31.07.2023)

Criteria	Comments
	• Food Engineering Journal (Science Direct)  • *Etc.* At present, most of journals are also open access which also can be used as modality to support students' learning. In addition to this, we also have our national journals which are open access and can be found at: https://sinta.kemdikbud.go.id/journals
Criterion 4.1 Module descriptions	*"However, one crucial piece of information that is currently missing is the allocation of ECTS credits to individual courses. This information needs to be included for greater clarity and transparency of the workload"* **Comm.:** We have revised our Module Handbook by inserting ECTS credits to the individual courses offered at FTSP.
Criterion 4.2 Diploma and Diploma Supplement	*"The Diploma Supplement contains information about the degree program, including soft skills acquired and awards (extra-curricular and co-curricular activities). However, it does not currently provide information on the grade distribution within the student cohort and the ECTS credits earned, which is necessary for potential employers to be able to properly assess a student's performance. Therefore, IPB has to add this statistical information"* **Comm.:** We have revised our Diploma Supplement by inserting ECTS credits as well as the Learning Outcomes and the average GPA of the graduated student compared to the average students' GPA within that class (*i.e.*, clustering student's quartile performance).

Criteria	Comments
Criterion 4.3 Relevant rules	Confirmed
Criterion 5 Quality management: quality assessment and development	Confirmed

F Summary: Expert recommendations (08.08.2023)

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Food Technology	Without requirements	30.09.2029	EQAS-Food	30.09.2029

Recommendations

E 1. (ASIIN 1.1 & 1.3) It is recommended that students' technical and entrepreneurial skills be improved, especially their basic knowledge of finance.

E 2. (ASIIN 3.1) It is recommended that pedagogical training should be compulsory for new lecturers.

G Comment of the Technical Committee 08 – Agriculture, Forestry and Food Sciences (13.09.2023)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the accrediting procedure and follows the assessment of the peers without any changes.

The Technical Committee 08 Agriculture, Forestry and Food Sciences recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Food Technology	Without requirements	30.09.2029	EQAS-Food	30.09.2029

H Decision of the Accreditation Commission (22.09.2023)

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

The Accreditation Commission discusses the procedure and follows the assessment of the experts and the Technical Committee without changes.

Assessment and analysis for the award of the EQAS-Food Label:

The Accreditation Commission deems that the intended learning outcomes of the degree programme do comply with the Subject-Specific Criteria of the Technical Committee 08 – Agriculture, Forestry and Food Sciences.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Food Technology	Without requirements	30.09.2029	EQAS-Food	30.09.2029

Recommendations

E 1. (ASIIN 1.1 & 1.3) It is recommended that students' technical and entrepreneurial skills be improved, especially their basic knowledge of finance.

E 2. (ASIIN 3.1) It is recommended that pedagogical training should be compulsory for new lecturers.

Appendix: Programme Learning Outcomes and Curriculum

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

Table 1.1. Corresponding general competencies and program learning outcomes of INQF, IAFT and IFT

The Indonesian National Qualification Framework (INQF)	
No.	**General Competencies**
#1	Graduates are capable of applying science, technology and art within her/his expertise and able to adapt to various situations
#2	Graduates can master general and specific theoretical concepts of specific knowledge and are capable of formulating problem-solving procedures
#3	Graduates are capable of making strategic decisions based on the information and data analysis
#4	Graduates are responsible for her/his own job for achieving the organization's goals
The Indonesian Association of Food Technologists Program (IAFT)	
No.	**Program Outcomes**
#1	Graduates are able to master the principles of Food Science (Food chemistry and analysis, Food microbiology, Food safety, Food process engineering, Food biochemistry, Nutrition and health, and Applied food science)
#2	Graduates are able to apply the principles of food science in an integrated manner during food production processes at industrial scale
#3	Graduates are able to communicate orally and in writing related to technical and non-technical aspects
#4	Graduates are able to think critically and analytically, solve problems, take responsibility for their work independently, and make appropriate decisions based on reliable information
#5	Graduates are able to work sensibly in a team and interact proportionally with others with different backgrounds
#6	Graduates have a commitment to ethical values as a professional in the food sector
The Institute of Food Technologists (IFT)	
No.	**Program Goals**
#1	Graduates are competent in core areas of food science
#2	Graduates can integrate and apply their knowledge
#3	Graduates are proficient communicators
#4	Graduates demonstrate professionalism and leadership skills

The following **curriculum** is presented:

Semester 1			
Code	**Courses**	**Credit**	**ECTS**
IPB110A	Religion	3(2-1)	4.5
IPB110C	Innovative Agriculture	2(2-0)	3
EKO1101	Economy	2(2-0)	3
IPB110F	English	2(1-1)	3
KIM1104	Chemistry	3(2-1)	4.5
KPM1131	Sociology	2(2-0)	3
MAT1102	Mathematics	3(2-1)	4.5
STA1111	Statistics and Data Analysis	3	4.5
	Credits:	**20**	**30**
Semester 2			
Code	**Courses**	**Credit**	
BIO1102	Biology	3(2-1)	4.5
FIS1104	Physics	3(2-1)	4.5
IPB1106	Indonesian Language	2(1-1)	3
IPB110D	Pancasila	1(1-0)	1.5
IPB110E	Civics	1(1-0)	1.5
IPB110G	Sports and Arts	1(0-1)	1.5
KOM1102	Computational Thinking	2(2-0)	3
MAT1104	Calculus I	3(2-1)	4.5
	Enrichment/Elective Course* (Learning hours)	3	4.5
	Credits:	**19**	**28.5**
Semester 3			
Code	**Courses**	**Credit**	
KIM1222	Organic Chemistry 2	3(3-0)	4.5
TPN1201	Global Perspective in Food Science and Technology	2(2-0)	3
TPN1202	Fundamental Chemistry and Food Chemistry	3(1-2)	4.5
TPN1211	Food Chemistry	3(3-0)	4.5
TPN1221	Food Microbiology	3(3-0)	4.5
TPN1241	Food Biochemistry	3(3-0)	4.5
	Enrichment/Elective Course (Learning hours)	3	4.5

	Credits:	**20**	**30**
Semester 4			
Code	**Courses**	**Credit**	
TPN1222	Food Microbiology Laboratory	2(0-2)	3
TPN1223	Food Fermentation Technology	2(2-0)	3
TPN1231	Fundamental Engineering in Food Industry	3(2-1)	4.5
TPN1232	Food Engineering I	3(2-1)	4.5
TPN1242	Metabolisms of Food Components	3(3-0)	4.5
TPN1233	Sensory Evaluation	3(2-1)	4.5
TPN1203	Food Regulation	2(2-0)	3
	Enrichment/Elective Course (Learning hours)	3	4.5
	Credits:	**21**	**31.5**
Semester 5			
Code	**Courses**	**Credit**	
TPN1301	Food Analysis	3(3-0)	4.5
TPN1302	Food Analysis Laboratory	2(0-2)	3
TPN1321	Food Safety and Sanitation	2(2-0)	3
TPN1331	Food Engineering II	3(2-1)	4.5
TPN1332	Food Manufacturing Technology I	4(3-1)	6
TPN1303	Research Design in Food Science	2(1-1)	3
TPN1341	Basic Functional Food	3	4.5
	Credits:	**19**	**28.5**
Semester 6			
Code	**Courses**	**Credit**	
TPN1333	Food Packaging and Storage Technology	2(2-0)	3
TPN1311	Food Additives	2(2-0)	3
TPN1334	Food Manufacturing Technology II	3(2-1)	4.5
TPN1335	Food Quality Assurance	3(2-1)	4.5
TPN1342	Biological Evaluation of Food Components	3(2-1)	4.5
TPN1304	Scientific Writing and Oral Communication	2(1-1)	3
TPN1336	Halal Assurance System	2(2-0)	3
	Enrichment/Elective Course (Learning hours)	3	4.5
	Credits:	**20**	**30**
Semester 7			
Code	**Courses**	**Credit**	
TPN1305	Food Innovation	3(1-2)	4.5
TPN1421	HACCP	2(2-0)	3
IPB303	Professional Development	3(0-3)	4.5
IPB400	Thematic Student Community Service	4	6
	Enrichment/Elective Course (Learning hours)	3	4.5

	Enrichment/Elective Course (Learning hours)	3	4.5
	Credits:	**18**	**27**
Semester 8			
Code	**Courses**	**Credit**	
TPN1498	Undergraduate Seminar	1	1.5
TPN1499	Final Year Project (Research/Internship)	6	9
	Credits:	**7**	**10.5**
	Total credits	**144**	**216**

*Elective/enrichment modules (18 credits) can be selected by student themselves, either in the form of elective modules offered by other study programs at IPB University, at other universities (in the form of credit transfer programs), or non-module activities (such as internships, field practice, independent study, entrepreneurial activities, and summer module program).