ASIIN Seal
Accreditation Report

Bachelor's Degree Programme
Physics

and

Master's Degree Programme
Biophysics

Provided by
IPB University Bogor, Indonesia

Version: 06 December 2024

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]
Program Sarjana Fisika	Bachelor's Degree Program in Physics	ASIIN	–	13
Program Master Biofisika	Master's Degree in Biophysics	ASIIN	–	13
Date of the contract: 19.02.2024 **Submission of the final version of the self-assessment report:** xx.xx.20xx **Date of the onsite visit:** 08./09.10.2024 **at:** IPB Bogor				
Expert panel: Prof. Dr. Gert-Ludwig Ingold, University of Augsburg; Prof. Dr. Walter Neu, University of Applied Sciences Emden/Leer and University of Oldenburg; Nick Wisely, Peer Industry – Jakarta; Jihan Shafiyah ZT, Student at Brawijaya University				
Representative of the ASIIN headquarter: Dr. Siegfried Hermes				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				

[1] ASIIN Seal for degree programmes
[2] TC 13 - Physics

Criteria used:

European Standards and Guidelines as of May 15, 2015

ASIIN General Criteria, as of March 28, 2023

Subject-Specific Criteria of Technical Committee 13 – Physics as of March 20, 2020

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 Physics	S.Si/B.Sc	–	6	Full time	–	8 Semesters	216 ECTS/144 sks	Annually / August 1995
Ma Biophysics	M.Si/M.Sc.	–	7	Full time	–	4 Semesters	54 ECTS/36 sks	Each semester / August 2007

For the Bachelor's degree programme in Physics and the Master's degree programme in Biophysics, the institution has presented the following programme educational objectives in the SAR:

Ba Physics	Ma Biophysics
To produce graduates who are able to work professionally as researchers, educators, and industrial practitioners in the field of physics and other related fields characterized by: 1. Ability to master the knowledge and methodology of physics and its application in various fields of work. 2. Mastering the scientific method to observe, analyze and understand various physical phenomena in the universe. 3. Ability to keep abreast of the development of physics in relation to the development of science, technology, industry and life in general. 4. Ability to convey ideas both orally and in writing as well as take a role and lead a work group. 5. Ability to continue studies to a higher level.	To produce Biophysics master graduates who have the following competencies: 1. Able to work professionally as a researcher, educator, or industrial practitioner in the field of biophysics and other related fields. 2. Able to solve problems related to biophysics systematically and scientifically. 3. Able to manage research independently or in groups using an interdisciplinary approach to produce innovations in biophysics and other related fields.

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

C Expert Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, Content & Implementation

Criterion 1.1 Objectives and Learning Outcomes of a Degree Programme (Intended Qualifications Profile)

Evidence:

- Relevant chapter of the SAR
- Program educational objectives (PEO), program learning outcomes (PLO), and list of courses available on the internet for the Bachelor Physics Study Program (https://physics.ipb.ac.id/ug-program/) and the Master Biophysics Study Program (https://physics.ipb.ac.id/master-in-biophysics/)
- Course and Learning Outcome (PLO) relationships Matrix of for the Bachelor Physics Study Program, Appendix 1.3.3 to the SAR
- Matrix of course linkages with the learning outcomes (PLO) for the Biophysics Master's Study Program, Appendix 1.3.4 to the SAR
- Relationship matrix (PEO) Master's Degree Program in Biophysics with SSC-13 ASIIN, Appendix 1.1.6 to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:

The expert team concludes that the IPB, Department of Physics (IPB/DoP) has thoroughly defined learning objectives and intended learning outcomes (LOs), which are in line with the Subject-Specific Criteria (SSC) of the ASIIN Technical Committee Physics. This applies to the Bachelor's programme in Physics as well as to the Master's programme in Biophysics. In correspondence with the SSC, the intended LOs take up the fundamental principles of classical and modern physics, while familiarizing students with key analytical tools to solve

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

physical problems (Bachelor's programme) and complex biophysical systems (Master's programme). Additionally, the experts observe that the (intended) learning outcomes are clearly complying with the level of qualification they are aimed at.

Accordingly, in terms of subject matters, the LOs for the Bachelor's programme focus on the basic principles of mechanics, thermodynamics, and electrodynamics, of quantum and solid-state physics, essential analytical and measurement tools as well as basic principles of experimentation. In addition, they address competences in scientific working and writing, communication skills and the ability to work in teams as well as aspects shaping the individual personality. Similarly, the intended LOs of the Master's programme in Biophysics cover biophysical concepts on an advanced level, including, for example, molecular biology systems using Physics concepts, properties of advanced materials, complex biophysical systems, methods of computational and experimental physics, etc. Communication skills, teamwork skills and ethical aspects of personal development are also learning objectives completing an adequate qualification profile for graduates of the Master's programme.

The expert team further acknowledges the process, in which the IPB/DoP regularly evaluates whether the programme learning objectives and (intended) programme learning outcomes are still complying with scientific and technological developments and the changing demands of the labour market. Stakeholder feedback is actively encouraged and, wherever reasonable and possible, taken into account in the revision of the curricula (most recently in the process of revising the 2014 curricula in 2020). Generally, the experts also commend the IPB/DoP for developing its curricula not only in compliance with the standards set out by Indonesian professional organisations such as the Association of Indonesian Physics Colleges (APTIFINDO), but also for matching them with highly reputed HEIs worldwide in order to keep abreast with the international state of the art.

In the discussion, the IPB/DoP clarifies that the alignment of the objectives and intended outcomes of its programmes with the overall strategic goals of the IPB is ensured, as the IPB has moved beyond its original focus on agriculture and related fields, and the DoP strives "to become a Physics Department that excels in Education based on collaborative basic and applied research at the national and international levels, especially in supporting innovations in agriculture, marine and tropical life sciences" (SAR, p. 1). In this way, IPB, the Faculty of Mathematics and Natural Sciences and the DoP jointly demonstrate that IPB's agricultural heritage must also be considered in the transformative sense of "harvesting solar energy".

Finally, the experts convince themselves that the learning objectives and (intended) LOs of the degree programmes under consideration – together with key study information – are published and accessible on the website of the IPB/DoP.

Criterion 1.2 Name of the Degree Programme

Evidence:

- Relevant chapter of the SAR
- Decree of the Minister of Research, Appendix 1.2.1 to the SAR
- IPB Rector Decree No. 001/K.13/PP/2005, Appendix 1.2.2 to the SAR

Preliminary assessment and analysis of the experts:

The experts state that the names of the degree programmes are fully compliant with the contents and at the same time meet the corresponding internal and national provisions.

Criterion 1.3 Curriculum

Evidence:

- Relevant chapters of the SAR
- K2014 curriculum bachelor's degree program in physics IPB, Appendix 1.3.1a to the SAR
- Bachelor degree in physics study program K2020 curriculum, Appendix 1.3.2a to the SAR
- MBKM guide book-2, Appendix 1.3.5 to the SAR
- Ba Physics Program Module Handbook, Appendix to the SAR
- Ma Biophysics Program Module Handbook, Appendix to the SAR
- Standard Operating Procedures IPB, Appendix 1.3.6 to the SAR (POB-IPB-S1-17: CURRICULUM ARRANGEMENT AND EVALUATION)
- Standard Operating Procedures IPB, Appendix 1.3.9 to the SAR
- Course Contract Advanced Mathematical Physics – FIS1206, Appendix 2.1.5 to the SAR
- Biomaterials Lecture Portfolio 2022-2023_K2020, Appendix 2.1.6 to the SAR
- Student Mobility – Ba Physics, Appendix 1.3.8a to the SAR
- Student Mobility – Ma Biophysics, Appendix 1.3.8b to the SAR
- Minutes of Ba Curriculum Workshop, Appendix 1.3.10a to the SAR
- Minutes of Ma Curriculum Workshop, Appendix 1.3.10b to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:

According to the SAR, the IPB/DoP currently runs three degree programmes: the Bachelor's programme in Physics, the Master's programme in Biophysics and the Doctoral programme in Physics. The PhD programme is not subject to the accreditation procedure. The Master's programme in Biophysics, which at first sight seems to be somewhat out of place in a university with a record of teaching and research in agricultural sciences, has obviously been deliberately developed and implemented. The experts heard that the IPB/DoP has broadened its disciplinary portfolio precisely in order to maintain its competitive edge and attractiveness to the younger generation of students. In addition, the Department argues that the competence of the Master's programme in Biophysics lies in the nature of biophysics itself, an interdisciplinary field that requires a deeper level of analysis than the Physics programme at Bachelor's level. Similarly, the SAR points to a favourable research environment for biophysics in the Department of Physics, due to the availability of various research topics related to agriculture, forestry, veterinary medicine and other traditional strengths of the university.

The team of experts evaluates the Bachelor's programme in Physics and the Master's programme in Biophysics at IPB/DoP on the basis of a thorough review of the SAR and the discussions held during the on-site visit. The evaluation covers the curriculum, programme structure, student mobility, placements and a review of the curriculum outcomes.

Curriculum

The experts learned that both the Bachelor's and Master's programmes had undergone a major curriculum revision in 2020 (the so-called K2020 curriculum). Reportedly, the main aim of this revision was to establish an Outcome-Based Education (OBE) model that is able to take into account the skills expected of students in the 2030s.

At the Bachelor's level, this has been achieved through an approach that allows students more flexibility to follow a personalised learning strategy based on multiple activities both on and off campus. In practical terms, this means replacing the previous major-minor curriculum with a curriculum structure that integrates the national Merdeka Belajar Kampus Merdeka Programme (MBKM Programme). The University Basic Courses, Interdepartmental Courses, Major Courses and Minor (Supporting) Courses have been replaced in the new K2020 curriculum by Common Core Courses (CCC), Fundamental Courses (FC), Academic Core Courses (ACC), Intensive Courses (IC), Enrichment Courses (EC) and Final Year Project (FYP). Both the minor (or supporting) courses in the old curriculum and the enrichment courses in the K2020 curriculum are elective courses.

The experts learnt that this programme provides opportunities for students to engage in extra-curricular learning through various channels such as student exchanges, internships/work placements, village projects, teaching in schools, entrepreneurial activities, etc. These are seen as opportunities for students to shape their individual focus and progress in their studies. It can be seen from the SAR that there are two main routes of implementing the MBKM programme in the Bachelor's programme. The first is the embedding of the programme in the EC area, either through additional lectures that deepen students' specialised knowledge or through multi-activities (off-campus and on-campus). The second way is to incorporate the LO requirements of the programme into the Final Year Project (FYP)/Capstone components. The implementation of Capstone in this sense is described in the SAR as an independent study model with the possibility of involving partners from research institutions such as Badan Riset dan Inovasi Nasional, BRIN (the National Research and Innovation Agency), or companies, from both the private and public sectors. Alternatively, students can choose to participate in a community service programme called Kuliah Kerja Nyata Tematik, KKN-T (Community Service Programme for Students-Thematic), in which groups of students from different disciplines engage in community service activities outside the campus to develop personal (soft) skills such as teamwork, communication skills, leadership skills or their ability to solve real-life problems. In this case, they are required to provide documentation of the results achieved, e.g. programme videos, publication of activities in print or online media, and KKN-T activity reports.

Regarding the Master's programme, the experts note that it is essentially offered in two versions: as a regular programme and as a by-research programme, the latter allowing students to continue their research in external institutions while pursuing their Master's education at IPB/DoP.

Overall, the reviewers find both curricula to be in line with the requirements of modern physics programmes and the outcomes to be in line with the exemplary LOs of the Subject-Specific Criteria of the ASIIN Technical Committee Physics for Bachelor's and Master's programmes in Physics. In the case of the Bachelor's programme, they see particular value in the flexible integration of the MBKM into the bachelor's curriculum, while they are persuaded by the multifaceted approach of the regular Master's programme and, equally, by the broad specialisation options to complement the research focus in the research-oriented version. Nevertheless, the Master's programme includes courses that are partly repeated from the Bachelor's programme. This issue will be addressed in the next paragraph.

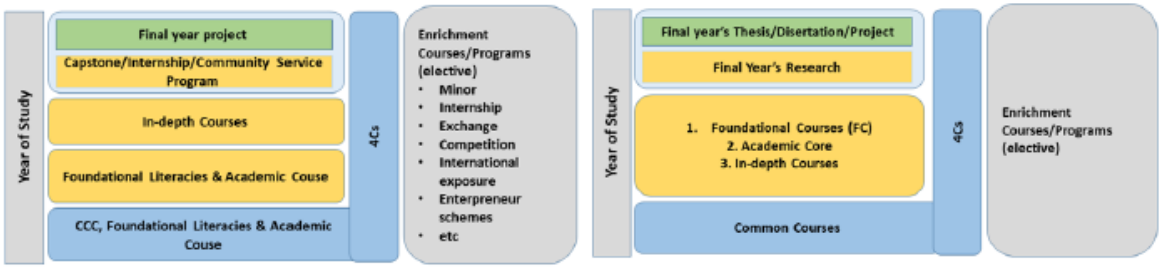
Structure

The curriculum for both the Bachelor's and Master's programmes is designed to offer a robust foundation in physics, while integrating interdisciplinary elements, especially within the Master's programme.

In their first year, students in the Bachelor's programme in Physics together with students from other disciplines are required to take a common core course in physics, ensuring a solid grounding in basic concepts. This foundational approach is beneficial as it provides a strong knowledge base that students can build on in advanced courses later in the programme. Furthermore, the integration of research activities at the undergraduate level, where Bachelor's students are required to complete a mini-thesis, fosters an early engagement with scientific inquiry. The basic concepts are assessed in the Bachelor's degree final project and are the assessment parameters for the final project.

The Master's Programme in Biophysics takes a research-driven approach and offers interdisciplinary courses that bridge physics with fields like medical and technical sciences. The flexibility in the programme is evident through the variety of electives, allowing students to specialize in areas such as bioenergy, biophotonics, or sustainable energy, aligning their studies with their research interests. However, attention is needed to ensure that the programme content is sufficiently advanced, as there are concerns about the repetition of modern physics material from the Bachelor's programme.

This results in the following structure of the programmes:



(a) Bachelor Degree Program in Physics (b) Master Degree Program in Physics

The experts conclude that, principally, both programmes are well-structured, but certain areas would benefit from optimization to enhance student learning and prevent overload.

In the Bachelor's Programme in Physics, the structure of the later semesters, particularly the 6th and 7th semesters, has been identified as highly demanding. Students are required to take multiple complex subjects in parallel, while also engaging with off-campus study options as part of the MBKM (Merdeka Belajar Kampus Merdeka) framework. This creates a heavy workload that could be overwhelming for students. However, when asked about these imbalance and potential structural peaks in their workload burden, students describe

the situation as challenging, but nevertheless doable. As the experts do not find a manifest issue with the structure of specifically the 6th and 7th semesters, they only suggest to the IPB/DoP to monitor the student workload particularly in these semesters and consider efforts to balance the theoretical and practical courses more effectively to alleviate some of the pressure during these critical semesters.

For the Master's Programme in Biophysics, the interdisciplinary focus is a strength, but the overlap of content with the Bachelor's programme, particularly in modern physics, should be addressed. (This could be done, for example, through an additional short course for non-physics students.) The Master's curriculum should prioritize offering advanced material that builds on, rather than repeats, undergraduate content. Additionally, the programme's enrolment numbers, which have been affected by the pandemic, need to be boosted. Current efforts by the department to promote the programme are a step in the right direction.

Unlike the undergraduate programme, the curriculum overview for the Master's programme on the website does not present modules/units in their chronological order per semester. As this would be more detailed and informative, the experts suggest that the curriculum attached to the SAR (Annex 1.3.2.b) should also be made available on the website.

Internships

Internships are a key component of both programmes, allowing students to apply their theoretical knowledge in real-world settings.

The Bachelor's students engage in internships that are linked to their research activities, with close supervision from both academic and industry mentors. They are required to produce detailed reports that outline the research goals and describe their internship experiences. Feedback from industry representatives indicates that the students perform well in these settings, particularly in terms of technical competence. However, there seems to be room for improvement in the development of soft skills such as project management and communication, especially in interdisciplinary research teams.

In the Master's programme, internships provide valuable practical experience, though they are not a mandatory part of the curriculum. Students are encouraged to seek internships through departmental support, and many benefit from personal introductions made by their supervisors. The university maintains strong ties with industry, which enhances the internship experience for students, ensuring relevance and a good match with current research trends.

Discussions with industry representatives also indicate that the English language skills of students of both degree programmes could be improved. The experts admit that IPB/DoP

has already decided on measures to counter this shortcoming (additional English courses; integrated transfer of language skills, Certifications, etc.). Nevertheless, they encourage the university and the IPB/DoP to further support the students' efforts to improve their language skills in English, e.g., by incentivising using English in subject-related assignments such as presentations (oral proficiency) and report writing (writing proficiency).

Mobility of Students

Concerning the mobility of students, the IPB/DoP reports about its efforts to encourage students for outbound learning activities taking different forms, ranging from attending lectures at other universities or implementing final assignments (internships or research), to workshops / conferences or short / summer / winter courses. The experts also note that, according to IPB/DoP management, learning outcomes gained at other universities can be recognised and that arrangements for such recognition are in place and valid. Accordingly, corresponding learning agreements are possible and usually based on existing collaborations or initiated by students and partner institutions. In this respect, they are further told that the university is making additional efforts to broaden the network of international partners, which would facilitate learning agreements between the partner institutions and the students and thus underline the recognition policies of the university. The experts find this commendable, as a strict policy for the recognition of knowledge and skills acquired at other institutions, including corresponding learning agreements, underlines the university's efforts to increase student mobility.

Student mobility, both short-term and long-term, thus plays an important role in the development of the students' academic and professional skills. The SAR reports 34 outgoings in the Bachelor's programme in Physics over the last five years and 8 outgoings in the Master's programme in Biophysics over the last five years. The department admits that it is not fully satisfied with these numbers, as more students are supposed to take advantage of these opportunities. The experts learn that the IPB/DoP is working to improve this situation, emphasizing at the same time the reciprocity of mobility programmes, which are supposed to focus on attracting incoming students as well. In particular, despite the current outgoings, the IPB/DoP acknowledges that its ERASMUS numbers are still unsatisfactory. According to this, main reasons are the financial situation of many students and a lack of awareness among them about the existing opportunities, including the option for applying for financial support either at university or at department level. Additionally, experts observe that the low interest in mobility activities is also caused by the dense curriculum in years 2 and 3 of the Bachelor's programme. Otherwise, the representatives of the IPB/DoP point out that there are many alternatives to studying in Europe, as well as collaboration opportunities within the region.

The experts notice that short-term mobility opportunities, such as summer schools and competitions, are well-integrated into the programmes and are popular among students. Financial support seems to be readily available, and students consider that the experiences gained significantly contribute to the development of both technical and soft skills.

However, long-term mobility, such as spending a semester abroad, is obviously less common due to financial constraints faced by many students. The IPB/DoP could do more to encourage and support longer study periods abroad, particularly by promoting the combination of these experiences with thesis work in the final semester. This would provide students with a valuable international perspective without extending their time to graduation.

Review and Perspective

The outcomes of the programmes are closely aligned with the university's strategic goal of interdisciplinary research and preparing graduates for the workforce.

In the Bachelor's Programme in Physics, the curriculum prepares students well for careers in industry, particularly in the ICT sector. Industry representatives confirm that graduates possess strong technical skills, which partly explains that students do not need a Master's degree to find qualified job opportunities in the industry. To maintain the practical focus of the programme, it is essential to continue investing in laboratory equipment to ensure that students have access to up-to-date resources for their experiments and research activities.

For the Master's Programme in Biophysics, the research-driven approach ensures that graduates are well-prepared for careers in research or specialized roles in industry. However, the overlap with Bachelor-level material, particularly in modern physics, should be addressed to provide students with more advanced content that adds significant value to their education. Alumni feedback has been positive, particularly regarding the development of both technical and soft skills, such as communication, teamwork, and critical thinking, all of which are crucial for interdisciplinary research. As noted above, feedback from industry representatives suggests that further progress is still possible in relation to soft skills such as project management and communication.

Concerning the study success and performance of graduates in the labour market, the experts learn that the IPB/DoP conducts annual profiling of its graduates, including telemapping, where students provide information about their career plans. This includes tracer studies to track alumni, their employment sectors, and salaries. According to this, approximately 70% of graduates secure well-paid jobs in the university's target areas, with 8% becoming entrepreneurs and 6% working in government agencies. Around 60-70% of graduates pursue professional careers in fields related to physics. In this respect, industry representatives confirm that IPB/DoP graduates, particularly in the ICT sector, are well-qualified.

The fact that significantly more Bachelor's than Master's graduates are employed in skilled industrial jobs reflects the already good job prospects of Bachelor's graduates. The experts commend the IPB's/DoP's efforts to keep track of their graduates and sustainable links to the alumni thus ensuring that relevant feedback from this major stakeholder group is utilized as a quality assurance information source.

Finally, the experts explicitly commend the IPB/DoP for its deliberate revision of the curricula taking into account the feedback from stakeholders. This highly commendable feedback cycle and quality assurance mechanism should be maintained.

Criterion 1.4 Admission Requirements

Evidence:

- Relevant chapter of the SAR
- Rector's Decree of IPB University No 5-IT3-PP-2017, Appendix 4.3.5 to the SAR
- Standard Operating Procedures IPB, Appendix 1.3.6 to the SAR (POB-IPB-S1-1 (Bachelor's programme;)
- Standard Operating Procedures IPB, Appendix 1.3.9 to the SAR
- Information on admission to the Bachelor's and Master's programme on the IPB website: https://admisi.ipb.ac.id/
- Audit discussions

Preliminary assessment and analysis of the experts:

The expert team notes that there is a centralized admission procedure administered by the DitAP (Direktorat Administrasi Pendidikan) and aimed at ensuring the admission and enrolment of qualified applicants, who can be expected to successfully complete their studies. As the experts learn, applications can be lodged online via a digital portal, where students can get the latest information for each programme, including important information related to registration (capacity, entry points, and registration schedule information). The process itself (responsibilities, acting persons/entities and procedural steps) is detailed in the Standard Operational Procedures for each programme. The experts also take note that, according to the SAR, the university explicitly ensures that all admission processes are inclusive and there is no discrimination based on disability and gender. Similarly, procedural and substantive admission requirements are transparently communicated on the IPB website.

From the standard operational procedures, the experts learn that there are multiple channels for the admission to the Bachelor's programme, namely:

(1) SNBP : National Achievement-Based Selection
(2) SNBT : National Test-Based Selection
(3) PIN : International and National Achievement (on special invitation)
(4) BUD : Selection through the Regional Envoy Scholarship scheme
(5) UTM IPB : Independent Written Test
(6) Foreign Student Admission
(7) Acceptance of transfer students from other colleges university
(8) Admission of students from other study programme (extension)
(9) Affiliate Student Admissions

In addition, applicants coming from the SNBP pathway must be high school students with science specialization. Furthermore, the IPB/DoP reports tracking and collecting data on the reputation of the school of origin based on the achievements of students and graduates who successfully study at IPB through periodic evaluation. This database is then used by IPB as a reference in the admission of new students in the following year. Student admission data show a decrease in application over the last five years (from 891 in 2019 to 547 in 2023) and steady increase of admissions (from 84 in 2019 to 108 in 2023).

Applications to the Master's programme are differentiated according to different streams of the programme:

- Regular programme
- By-research programme.

Admission requirements *for the regular and by-research streams are*

- a GPA of the previous stratum of at least 2.75 or equivalent
- entrance test for students with a GPA of 2.50 – 2.74
- Certificate of English language ability (TOEFL international or institutional or equivalent) with a score of 475
- additionally, for the by-research stream: one national or one international publication (Scopus indexed); a job in the field of research (for at least two years).

Additionally, international students applying for admission to the Master's programme have to provide a letter of intent not to work while a student in Indonesia and a letter of

intent not to intervene in political activities in Indonesia and to comply with applicable laws in Indonesia.

The department reportedly uses an electronic prioritisation system to facilitate the selection of students, with around 80% of decisions then being made through a colloquium and final approval by the dean. As to the admission statistics for the Master's programme, the IPB/DoP is aware of the low enrolment numbers, which it essentially attributes to insufficient demand, with Bachelor graduates flooding the labour market, and plans to increase promotion of the programme in the future.

Overall, the experts consider that the admission rules and procedures, which are mostly based on official, transparent, and binding regulations, are adequately communicated and thoroughly implemented. They note positively the efforts made by the DoP to utilize the admission process to select qualified students for the Bachelor's and Master's programmes. In the Master's programme, with its generally broad admission pathways, where the DoP opts out of defining strict subject-related requirements, this is especially challenging. However, the experts are confident that foreseeable enrolment numbers and the meticulous selection procedure at the IPB/DoP will contribute to the admission of qualified students into the Master's programme as well.

Criterion 1.5 Workload and Credits

Evidence:

- Relevant chapter of the SAR
- Standard Operating Procedures IPB, Appendix 1.3.6 to the SAR
- Credit Equivalency for Undergraduate Program_230801_103957, Appendix 1.5.1 to the SAR
- Audit discussions

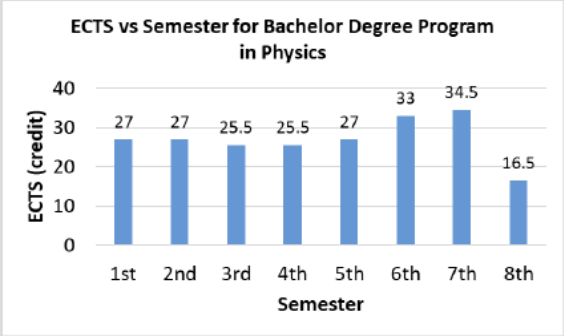
Preliminary assessment and analysis of the experts:

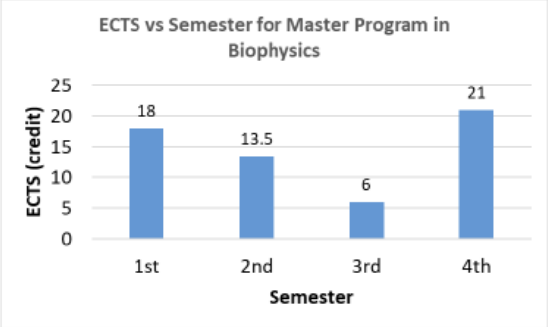
According to the SAR, the Bachelor's Programme in Physics at IPB University requires a minimum of 144 credits (216 ECTS) and a maximum of 160 credits (240 ECTS) to graduate, following national regulations on higher education standards. The curriculum is designed to be completed over eight semesters. The study load is pre-defined, with each semester credit unit (SKS) requiring specific amounts of face-to-face, structured, and independent activities. Equivalence between SKS and ECTS is clearly established (1 SKS equals 1.5 ECTS).

The Master's Programme in Biophysics requires a minimum of 36 credits (54 ECTS), aligning with national regulations. The programme is designed to be completed in four semesters, and students are expected to publish research in national or international journals.

In the experts view, both programmes utilize a systematic approach to determine study loads, which are monitored by academic advisors based on the student's GPA. According to the SAR, the study load is determined through consultation, and adjustments are made to suit student performance. For example, students with a GPA below 2.0 can take a maximum of 19 credits, while those with a GPA above 2.76 can take up to 24 credits (36 ECTS).

The expert team notes positively that study load is evaluated regularly, and study progress monitored via internal systems, such as SIMAK for the Bachelor's programme and SIMONEV for the Master's programme. Workload is reported to be monitored in the course evaluation at the end of each semester through various internal systems to ensure that the study load is in line with the planned learning outcomes.





However, the credit point distribution, particularly in the Bachelor's programme, clearly indicates – as mentioned earlier (see chapter on curriculum, 1.3) – an imbalance in the sixth and seventh semesters. Despite the IPB/DoP's summary insisting that the workload evaluations so far have not indicated any major discrepancies in the distribution of student workload and credits, students confirm the challenging study schedule during these semesters, although they generally find the workload bearable. The experts understand the rationale behind this curriculum structure, which aims to maintain the benefits of a strong Physics core curriculum while taking advantage of the opportunities provided by the national Independent Learning Independent Campus (MBKM) programme to diversify students' off-campus experiences and support their character development. Based on this finding, they advise closely monitoring the workload during this study phase to avoid overburdening students and undermining the strengths of the Bachelor's programme.

Additionally, the review team finds the attribution of six SKS (or nine ECTS) to the Thesis in the Master's programme in Biophysics insufficient in reflecting the actual workload required to draft this scientific work over the course of a year. While they recognize that the

credit volume for the Thesis has been decided in accordance with mandatory provisions on credit allocation, they are also aware of the inherent flaw in this approach. Consequently, the review team recommends that the IPB/DoP explore options to adequately document the student workload for the Master's thesis, for example, in the Diploma Supplement.

The survey measuring the time spent by Bachelor and Master students on structured assignments and individual assignments seems to lack significance if the most relevant indicator for identifying deviations from the underlying calculation is condensed in the form > 40 minutes/week. Obviously, this indicator is the least meaningful, as it doesn't specify the range of deviations from the underlying workload calculation. If this survey is to be revised in the future, particularly this indicator should be reconsidered and splitted into at least two time ranges.

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

- Relevant chapter of the SAR
- Ba Physics Program Module Handbook, Appendix to the SAR
- Ma Biophysics Program Module Handbook, Appendix to the SAR
- Standard Operating Procedures IPB, Appendix 1.3.6 to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:

According to the SAR, the Bachelor's programme uses a variety of teaching methods, including online, offline, and blended learning modes. Learning approaches include lectures, project-based learning (PBL), and case studies. The programme is supported by a Learning Management System (LMS), which provides access to lecture materials, assignments, and exams.

According to the SAR, the Master's programme particularly emphasizes the department's student-centered learning (SCL) approach, as eight compulsory courses in the first year employ SCL methods such as project-based and case-based learning. Elective courses, such as Radiation Biophysics, also utilize student-focused activities. Thus, students engage in individual or group assignments, presenting their research and scientific studies in class to enhance both knowledge and communication skills. In the view of the department, the programme successfully adapted to online learning during the COVID-19 pandemic, leveraging

the flexibility of online courses for discussion, literature reviews, and independent assignments.

Apart from that, the experts note that the IPB University offers several programmes aimed at improving student writing and research skills, particularly, but not only, for the Master's students.

In general, the experts commend the IPB/DoP for its student-centered approach, which is reflected in the variety of teaching methods that are well-aligned with the intended learning outcomes of the courses. In this context, they particularly acknowledge the role of project-based learning and case studies, as these are essential tools for familiarizing students with independent scientific work and methods.

The experts highlight the effectiveness of the LMS, which, in their view, facilitates interactions between students and lecturers, thereby enhancing the learning process. Furthermore, the review team believes that the LMS gains additional value from the fact that lecturers are encouraged to innovate in their teaching through shared course portfolios and ongoing training in LMS optimization.

In this regard, it contributes positively to the ongoing reflection and improvement of the teaching process that both study programmes conduct evaluations of the learning process, methods, and outcomes, with students also providing feedback on infrastructure and teaching methods.

Overall, the experts are very satisfied with the teaching and learning strategies employed in the study programmes under review.

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

The experts welcome the IPB/DoP's comments on the report and appreciate the progress already made or planned in response to their suggestions. This applies to a number of measures planned or already taken, such as the publication of a detailed curriculum for the MSc in Biophysics, efforts to increase enrolment in the Master's programme, initiatives to improve management, communication and English language skills, and measures to increase student mobility (all Criterion 1.3).

In addition, the experts would like to comment separately on three aspects:

a) The experts are generally satisfied with the IPB/DoP's announcement that students' work on the Master's thesis will be adequately reflected in the Diploma Supplement. Even

more promising is the indication that the effort students put into their thesis work will be adequately measured in a new national legislation on Master's programmes. The experts would still like to see the Diploma Supplement adapted and, in the meantime, consider this to be an issue that needs to be addressed as a matter of priority (see below, Section F, Requirement 2).

b) The review team appreciates the announcement by the IPB/DoP to revise the curriculum of the Master's programme to address the issue of inappropriate repetition of Bachelor's content in the next curriculum revision in 2025. As no change has been decided so far, the experts confirm the recommendation formulated to this effect (see below, Section F, Recommendation 2.

c) With regard to the comparatively high student workload in the 6th and 7th semesters of the Bachelor's programme, the review team notes positively that the IPB/DoP has proposed to closely monitor the student workload in these semesters in particular. In this context, the review team also recognizes that the workload survey will be revised by the IPB/DoP, particularly with respect to the applied indicators.

The review team considers that the requirements of the standard are not yet fully met.

2. Exams: System, Concept and Organisation

Criterion 2 Exams: System, Concept and Organisation

Evidence:

- Relevant chapter of the SAR
- Rector Decree 308-IT3-PP-2020 – exam, Appendix 2.1.1 to the SAR
- Standard Operational Procedure – Exam (Ba), Appendix 2.1.2 to the SAR
- Standard Operational Procedure Postgraduate Program, Appendix 1.3.9 to the SAR
- Exam Question Verification Form for Advance Mathematical Physics (FIS1206; Ba), Appendix 2.1.3a to the SAR
- Biophysics and Complexity question verification form (BFS507), Appendix 2.1.3b to the SAR
- Multistrata answer sheet, Appendix 2.1.4 to the SAR
- Biomaterials Lecture Portfolio 2022-2023_K2020, Appendix 2.1.6 to the SAR
- Advance Mathematical Physics End of Semester EXAM, Appendix 2.1.7 to the SAR
- Class course exam and its elements and proportions, Appendix 2.1.8 to the SAR
- Colloquium assessment rubrics, Appendix 2.1.9 to the SAR
- Seminar assessment rubrics, Appendix 2.1.10 to the SAR
- Physics capstone assessment form, Appendix 2.1.11 to the SAR
- Assessment result decision form, Appendix 2.1.12c to the SAR
- Components and Elements of the Bachelor's Degree Program In Physics Final Project Examination Assessment, Appendix 2.1.13 to the SAR
- Report on The Result of The Master's Program Thesis Defenses . Jayadi NIM G75011202007 -signed (ENGLISH), Appendix 2.1.14 to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:

From the SAR, the experts learn that the Bachelor's and Master's programmes at IPB University implement various types of exams to measure the achievement of Programme Learning Outcomes (PLOs). For the Bachelor's programme, exams include class course exams, off-class course exams, and a Bachelor Thesis. Class-type exams in the Bachelor's programme in Physics include elements such as paper-based exam (mid and end of semester), computer-based exam, project-based exam assignment, and quizzes. The typical element of the off-class-type exams is field practice. The Bachelor thesis consists of different parts:

colloquium, seminar, final year report, and comprehensive and final year exams. In the case of the Master's programme Biophysics, the types of exams are class course exams, seminars, and a Master Thesis. Typical forms of class-type exams are written exams, assignment report and project report. Similarly to the Bachelor Thesis, the Master Thesis includes an oral defence of key thesis' results as proof of the Master candidate's ability to not only work independently on a set problem in the field of Biophysics, but also to communicate essential results to a competent audience.

The experts further learn from the SAR, that examinations are scheduled according to the academic calendar and require a minimum attendance rate of 80% for lectures and 100% for practical sessions. The IPB University has made accommodations for students with physical and mental health challenges, including access to lower-floor exam rooms and hybrid lecture options.

The exam structure includes provisions for students who miss exams due to valid reasons, such as illness, with the opportunity to take supplementary or make-up exams. The results of exams are communicated within two weeks, and students can access their grades via a mobile app or discuss clarifications with their lecturers. Grades are based on numerical scores and translated into grade points.

Moreover, it is reported that to ensure alignment with Course Learning Outcomes (CLOs), exam questions undergo a verification process to check their relevance and timing. Verified questions are submitted through an online system for both programmes. Additionally, the IPB/DoP enforces academic integrity policies, with students required to sign declarations against cheating and adhere to writing ethics guidelines.

In terms of quality assurance, the department points out that a so-called Quality Control Group holds an academic evaluation workshop at the end of each semester. Course coordinators are required to submit portfolios that include semester plans, exam evaluations, and student feedback to assess whether the exams effectively measure the intended learning outcomes.

The review team positively notes the department's efforts to verify the students' study progress through a strategy that combines continuous assessment with a range of examination forms aligned with the intended CLOs. It is well-received in this respect that students value the variety in exam formats, including written exams (especially for fundamental courses), presentations, and project-based learning.

With regard to the comprehensive learning and understanding of students' theoretical and practical studies, the experts pay particular attention to the Bachelor's and Master's theses in the programmes. They are convinced that the thesis, together with the complementary

elements of the Thesis examination and the deliberate arrangements for its conduct and supervision, provides convincing evidence of the students' ability to work independently and under time pressure to solve a defined problem in their field and to the required level of qualification. Exemplary dissertations (and examinations) examined by the experts during the site visit were considered to be of an appropriate level and to demonstrate the achievement of the learning outcomes.

The expert team also recognises that not only are rules and procedures for the conduct of examinations in place at the university and departmental level, but that they are successfully implemented. In this context, it is also noted that students appear to be satisfied with the organisation of exams and, in particular appreciate the scheduling of assessments, with only one exam per day, giving them sufficient time to prepare.

Regarding the IPB/DoP's academic integrity policies, the experts were informed that ChatGPT has not been an issue so far, as most exams are conducted in person. The experts commend lecturers for their efforts to use advanced AI technologies, like ChatGPT, as a tool for learning. This approach, which aims to develop the students' ability to critically reflect on the use of such tools, appears to be yielding results, as students confirm a cautious handling of advanced AI tools, such as ChatGPT, while acknowledging their usefulness in advancing their learning.

Overall, the expert team considers the examination system at the IPB/DoP to be appropriate and supportive in achieving the intended learning outcomes (LOs). In addition, the experts commend the IPB/DoP for implementing mechanisms to continuously review the assessment system and its results with the aim of improving exam standards and course quality.

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

No additional comment.

The review team considers that the requirements of the standard are fully met.

3. Resources

Criterion 3.1 Staff and Development

Evidence:

- Relevant chapter in the SAR
- Staff handbook, Appendix 3.1.3 to the SAR
- Departments of Physics Lecturer profile graph, Appendix 3.1.2 to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:
The expert team is informed that already 20 full-time lecturers (20 in the Bachelor's programme and 14 in the Master's programme) are participating in the delivery of the programmes. Most of these full-time lecturers (15) do have a doctorate in related disciplinary fields as the experts learn from the information presented in the staff handbook. As regards the distribution of academic positions, 4 out of 20 are full professors, 6 associate professors and 10 assistant professors. According to the SAR, PhD degrees have been awarded by national and international universities, which in the eyes of the experts can contribute to a curriculum development that meets international standards.

Non-permanent lecturers, however, are particularly relevant for elective courses, where they handle specialized topics. Guest lecturers and visiting lecturers are often brought in to engage experts from other countries or the industry (mainly from the industry). For adjunct professors, the focus is especially on international candidates.

The experts take note that each of the DoP's full-time lecturers is affiliated to one of three existing divisions in the DoP, namely Applied Physics Division, Biophysics Division, and Theory Physics Division. Research activities of the lecturers are thus developed in the three divisions with reference to a roadmap and research topics followed by each division. Consequently, the competence of each academic staff is identified based on their education, interests, and research activities. The results of those activities on the other hand are considered as an input for the enhancement of the Bachelor's and Master's programmes.

According to the IPB/DoP, the workload of lecturers is distributed at the beginning of each semester according to the teaching load of individual staff members, their expertise in the courses offered in that semester and their workload investment in non-teaching (administrative) activities. The experts heard that lecturers have a weekly workload of between 6 and 8 hours, but that the workload can be particularly heavy in the first semester, especially as DoP lecturers are responsible for delivering undergraduate physics courses for the whole

university. Some classes reportedly have up to 100 students. Despite the teaching demands, lecturers seem to find enough time for research. This seems to be particularly true for younger lecturers, who may be working towards a Ph.D. They report the possibility of reducing one or two courses in order to have time for personal development or further training. The experts have the impression that, as in the general workload planning meeting, the IPB/DoP encourages a balanced ratio between teaching and research.

Teaching, research and community service hours of lecturers are accumulated and need to be registered by each individual in a "Performance Index", which reportedly is not only an incentive for additional payment, but also the very basis of career promotion within the university (full, associate, assistant professor ranks).

The IPB and other universities or institutions provide opportunities for lecturers to develop their professional or didactic skills, and lecturers take advantage of these opportunities, as confirmed during the on-site meetings. The experts note that, in addition to didactic training certificates, many lecturers have obtained professional or industrial certificates. Further, the expert team takes note that the DoP provides incentives for the development of core academic skills by providing funds for faculty mobility and research publication to support faculty mobility and research activities. In this context, the DoP also refers to the possibility for lecturers to take a sabbatical or a research stay. Similarly, funding for such opportunities is often available through the department in the form of grants.

Taking all this into account, the expert team concludes that the teaching staff and the additional administrative and technical staff managing the programmes meet the qualitative and quantitative requirements for the delivery of the Bachelor's and Master's programmes. Opportunities for didactic and academic development of the teaching staff are provided and supported by the IPB/DoP. In addition, a systematic approach to internal career advancement can be observed, which further incentivises the development of lecturers' individual qualification portfolios.

Criterion 3.2 Student Support and Student Services

Evidence:

- Relevant chapter of the SAR
- Expenditure of Ba Physics and MSc Biophysics for 2020 – 2023 fiscal year, Appendix 3.3.1 to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:
The experts are positive about the existence of a wide range of support services and staff at both university and departmental level. At university level, they see the "Directorate of Student Affairs and Career Development", which in many ways performs strategic tasks in student administration, welfare and career development. These IPB units and sub-units are supported by related services in the DoP.

In terms of academic advice and guidance, the appointment of an academic advisor for each student is a cornerstone of the department's support structure. The supervisors provide academic guidance by arranging face-to-face meetings, determining the number of credits for compulsory and elective courses per semester, monitoring study progress, determining final project research topics and overseeing the progress of final project research. In addition, final project supervisors guide students in their final year projects and research activities. Welfare, health and career development services at departmental level complement related activities at central level. The experts were also informed of bursary schemes available to students to reduce the cost of study and research.

In the context of career development, IPB management also reports about a variety of student programmes tailored to different academic pathways. One such programme focuses on collaboration with industry, inviting companies to participate. There are internship programmes, a young entrepreneur programme, and coaching initiatives where students are coached within industry settings.

Overall, the experts consider that the support services provided by IPB/DoP adequately implement its student-centred approach to teaching and learning. The guidance and counselling services offered to students at different stages of their studies and in individual situations are supportive of the achievement of learning outcomes in particular and of study progress in general.

Criterion 3.3 Funds and equipment

Evidence:

- Relevant chapter of the SAR
- Expenditure of Ba Physics and MSc Biophysics for 2020 – 2023 fiscal year, Appendix 3.3.1 to the SAR
- Data on infrastructure (rooms) managed by the Department of Physics, Appendix 3.3.2 to the SAR
- Department of Physics's Main laboratory facilities List, Appendix 3.3.3 to the SAR

Preliminary assessment and analysis of the experts:
According to the SAR and clarification by the IPB management, the IPB is an autonomous university, with funding coming from multiple sources (public funding, tuition fees, third-party funding). On a yearly basis, the university centrally allocates funds from tuition fees, government resources, and third-party research collaborations with industry. A minimum budget of approximately 17,500 USD is available for laboratory work, with up to 40,000 USD possible. Research funds appear to be fully available to researchers, although, according to lecturers, there may be a delay in receiving them. The experts were told, that both internal and external funding sources are utilized, including from the Ministry of Education. Temporary financing options appear also to be possible.

High-cost equipment is primarily purchased at the university level, while individual faculties buy less expensive apparatuses. Generally, the department, faculty and university manage maintenance of facilities and infrastructure jointly. The IPB/DoP disposes of the range of the laboratories divided up into those, primarily used for education and those used for research. In accordance with this, educational laboratories include

- Basic Physics Laboratory, Electronics Laboratory, Advanced Physics Laboratory, Network and Microcontroller Laboratory, Sensor System Laboratory, Laser and Photonics Laboratory.

Key research laboratories are

- Theory and Computational Physics Laboratory, Materials Analysis Laboratory, Spectroscopy Laboratory, Biophysics and Nanostructure Laboratory, Material Biophysics Laboratory, and Optoelectronic Material Physics Laboratory.

During the on-site visit, the expert team was able to inspect the laboratories of the department. They are of the opinion that most of the laboratories used in education are appropriate and sufficient to serve the educational purposes of the degree programmes under consideration. With respect to the significant role of hands-on experience and practical competences in applying theoretical knowledge to real-world projects, the experts nevertheless suggest that the IPB/DoP should continue to further develop the department's laboratory equipment.

Concerning the research labs, the review team was impressed with the advanced facilities at the IPB and the research opportunities they provide for the activities of the DoP research staff. By integrating research results into curriculum development and, more directly, including students in research projects with lecturers, these laboratories play a vital role in maintaining the quality of the degree programmes in line with technological and scientific

developments. In this context, the experts highly commend the strategy of sharing expensive laboratory infrastructure within university networks, as realized in the case of the advanced laboratory center at IPB.

Representatives of BRIN, the Indonesian National Research and Innovation Agency, confirmed its considerable engagement in research collaborations with IPB, emphasizing student involvement in joint research projects, including the opportunity for students to contribute to scientific papers.

While collaborations between IPB and industry in research involving students are reportedly gaining importance, the expert team considers the strong links to industry a key strength and crucial strategy of IPB for ensuring the employability of its graduates. The high employment rates of Bachelor's graduates in targeted fields of qualification are evidence of the effectiveness of this strategy, although, to a certain extent, this success seems to come at the expense of enrolment numbers in the Master's programme.

In addition, the experts see cooperation with countries in the region, such as Japan and South Korea, as a strategy for promoting its programmes across borders and strengthening the competitiveness of its students and graduates. This is evidenced by the University's 37 current education and research consortia, including several ERASMUS programmes. During the meetings, the experts observed that students and teachers are encouraged to participate in these programmes in order to promote international cooperation.

Overall, the review team considers the financial and physical resources as well as the collaborations of the IPB/DoP to be adequate and, in some aspects, exemplary for the study programmes under consideration.

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

The team of experts thanks the IPB/DoP for their comments. As the issue of departmental laboratory facilities has not been directly addressed, the experts confirm their recommendation to further develop these facilities in order to strengthen the practical parts of the curriculum (see below, Section F, Recommendation 1).

The review team considers that the requirements of the standard are sufficiently met.

4. Transparency and Documentation

Criterion 4.1 Module Descriptions

Evidence:

- Relevant chapter in the SAR
- Ba Physics Program Module Handbook, Appendix to the SAR
- Ma Biophysics Program Module Handbook, Appendix to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:
The expert team takes note of the diligently edited module handbooks. They include essential information about the degree programmes such as LOs, contents, prerequisites, examination forms, teaching methods, assessment forms, persons responsible for the module, language of instruction, and reading list. As a key information source of the students, the module handbooks are accessible online.

However, the review team observes that key descriptions such as those for the Colloquium, Capstone in Physics and the Final Year Project in the Bachelor's programme, the Graduate School Seminar (Elective Course), Colloquium, Seminar, Thesis in the Master's programme are not available, neither in the version presented in the annexes to the SAR nor in the published version. They opine that these descriptions should be supplemented in the course of the accreditation procedure.

With regard to the courses/modules of the first year of study, which is essentially considered to be a foundational period of study, the review team notes that module descriptions are made available online in a separate module handbook. Although the descriptions could not be checked at the time, the experts assume that they are available to students.

In addition, the expert team suggests that it would improve the readability of the module handbooks if they included a table of contents (perhaps linked to the descriptions), a foreword and a chronological order of course/module descriptions.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Relevant chapter in the SAR
- The diploma, transcript and SKPI documents in Ba Physics Program, Appendix 4.2.1a to the SAR

- The diploma, transcript and SKPI documents in Ma Biophysics Program, Appendix 4.2.1b to the SAR

Preliminary assessment and analysis of the experts:
The experts take note that the IPB/DoP has presented a final document (Certificates, Transcript of Records and Diploma Supplement) for the Bachelor's and the Master's degree programme. The Diploma Supplement provides information on the structure of the course, its contents and learning outcomes as well as on the individual performance of the student. The experts find the Diploma Supplement informative, generally, but consider the indicated individual marks and grading insufficient for external stakeholders, in particular potential employers or universities from abroad. The information presented does not allow a meaningful classification of the performance of the individual graduate. The experts therefore consider it necessary to identify the graduate's performance more plausibly by adding a grade distribution to the marks and rankings. To this end, the IPB/DoP may refer to the ECTS Users' Guide for guidance.[5]

In this context, the experts point out that even a more meaningful classification of individual performance will hardly facilitate a conclusive understanding without further information on the higher education system of the home country, especially with regard to external stakeholders abroad. They therefore consider that this additional information is also necessary.

Criterion 4.3 Relevant Rules

Evidence:

- Relevant chapter in the SAR
- Standard Operating Procedures IPB, Appendix 1.3.6 to the SAR (Ba)
- Standard Operating Procedures IPB, Appendix 1.3.9 to the SAR (Ma)
- Law No 20-2003 on the National Education System, Appendix 4.3.1 to the SAR
- Law of The Republic of Indonesia Number 14 Year 2005, Appendix 4.3.2 to the SAR
- Regulation of Ministry of Research, Technology and Higher Education No 62-2016, Appendix 4.3.3. to the SAR
- Rector's Decree of IPB University No 13-IT3-KM-2015, Appendix 4.3.4 to the SAR

[5] The ECTS Users' Guide (2015) can is available on the internet: https://op.europa.eu/en/publication-detail/-/publication/da7467e6-8450-11e5-b8b7-01aa75ed71a1

- Rector's Decree of IPB University No 5-IT3-PP-2017, Appendix 4.3.5 to the SAR
- Rector of IPB University Regulation No. 3-IT3-PP-2018 (Education Quality Standard of IPB)_new, Appendix 4.3.6 to the SAR
- Decree of the Academic Senate of IPB University No 28 SA IPB P 2018, Appendix to the SAR
- Decree of the Academic Senate of IPB University No 34 SA IPB P 2020, Appendix 4.3.8 to the SAR

Preliminary assessment and analysis of the experts:
The expert team states that the rights and duties of both the higher education institution and students are clearly defined and binding (guidelines, statutes etc.). All course-related information is available in the language of the degree programme and accessible online for anyone involved.

During the discussion, international students in particular expressed the view that information about the physics programmes at IPB could be disseminated more effectively to attract a wider audience of incoming students, which could particularly benefit the Master's programme in Biophysics.

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

The expert team takes note of improvements that have already been achieved and planned activities that will contribute to the transparency of the programmes.

Module descriptions

The experts recognize that missing module descriptions have been added and published on the IPB's/DoP's websites for both degree programmes. Although a module description for the Graduate School Seminar (Elective Course) still seems to be missing, the experts assume that this will be added soon. As a result, they conclude that a corresponding requirement should be deleted.

In this context, they appreciate that module descriptions of the first study year of the Bachelor's programme have been included in the Module Handbook for reasons of an easy access and improved transparency of all module descriptions.

Diploma Supplement

The review team notes positively that the IPB/DoP plans to revise the Diploma Supplement in order to better reflect the performance of the individual graduate in the programme. As this has not yet been done, the experts continue to propose a requirement to this end (see below, Section F, Requirement 1).

The review team considers that the requirements of the standard are not yet fully met.

5. Quality management: quality assessment and development

Criterion 5 Quality management: quality assessment and development

Evidence:

- Relevant chapter of the SAR
- General QA data on the website: https://physics.ipb.ac.id/quality-assurance/; identical evaluation results from an IPB/DoP stakeholder event in April 2024 also documented on the degree programmes' websites: https://physics.ipb.ac.id/ug-program/academic-evaluations/ (Ba); https://physics.ipb.ac.id/master-in-biophysics/academic-evaluation/ (Ma)
- Diagram of the Physics Department's quality assurance implementation structure, Appendix 5.1.1
- Standard Operational Procedures (SOP) – Undergraduate Programme Implementation IPB University, Appendix 1.3.6 to the SAR
- Bogor Agricultural Institute Chancellor Decree 183/IT3/PP/2020 regarding Standard Operational Procedure Implementation of the Postgraduate Education Programs, Appendix 1.3.9 to the SAR
- Audit discussions

Preliminary assessment and analysis of the experts:

The review team takes note that the IPB has put in place a quality assurance (QA) system for the University's degree programmes that embraces internal and external QA instruments, and in terms of internal QA combines processes ("Standard Operational Procedures") and instruments on several institutional layers (University, department, programme, and course level). Apart from that, external QA is particularly provided by national (or for that matter international) accreditation bodies; in addition, survey feedback of external stakeholders such as alumni or companies are also considered as external QA instruments.

According to the SAR, internal QA for the degree programmes at IPB/DoP is conducted through four mechanisms:

1. Assessment by the Quality Management Office/Kantor Manajemen Mutu (KMM) of IPB once a year,
2. Assessment by the Quality Assessment Taskforce of Physics Department, IPB,
3. Evaluation by the students twice per semester, and

4. Satisfaction surveys by lecturer, non-academic staff, as well as students, also twice per semester).

The experts commend the IPB/DoP for its effective implementation of the PDCA cycle of QA. Responsibilities at different levels are clearly assigned to staff functionaries and functional units, with the Quality Control Group as the main discussion and communication hub for QA results in the IPB/DoP.

The experts also commend the IPB/DoP for well-defined and effectively implemented procedures for the various quality assurance processes and tools ("standard operational procedures"). Regular course evaluations and programme assessments, as well as surveys and meetings with alumni and other stakeholders, enable the department to collect relevant data and translate them into actionable results. The IPB/DoP has convincingly demonstrated how the results of the internal quality assurance processes are used to improve student satisfaction with the study programmes and the overall quality of the programmes. The experts positively note that students and other stakeholders are generally informed about the evaluation and survey results as well as conclusions derived thereof.

Similarly, it is commendable that key evaluation findings or input from stakeholder meetings are published on the IPB/DoP websites, although the expert team is concerned about the appropriateness of publishing the full names not only of alumni but also of active students who are critical of or provide input to their programmes. Even if a very trusting atmosphere between students, staff and departmental management was the predominant impression of the experts during the site visit, the publication of full names should be avoided, especially in the case of active students, as this could have a negative impact on or hinder student involvement in the internal QA of the degree programmes.

The alumni, with the exception of the research group, indicated in the discussion that their involvement in the development of the department and the study programmes, as well as the links with students and staff should be intensified in order to make the best use of the resulting synergies for the IPB/DoP and their companies. This suggestion also appears as part of the summarised evaluation results published on the programme websites.

Overall, however, the experts reiterate their very positive assessment of the internal quality assurance of the programmes under review.

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

The experts are grateful for the IPB's/DoP's comments. They particularly welcome the fact that the Department has already anonymised student feedback on the programmes on its

website in order to protect student privacy. The experts commend the IPB/DoP for adequately addressing their concerns and do not consider this an issue for their final recommendation.

The review team considers that the requirements of the standard are met.

D Additional Documents

No additional documents needed.

E Comment of the Higher Education Institution (18.11.2024)

The institution provided a statement and some updated information on the programmes on the IPB's/DoP's websites. These documents are addressed in the final assessment of the experts as necessary.

The following quotes the comment of the institution:

1. **Degree Program: Concept, Content, and Implementation**
   "We are pleased that the degree program criteria of Ba Physics and Ma Biophysics, including learning objectives and outcomes, name of the degree programme, curriculum, admission requirement, workload and credit, and didactic and teaching methodology are considered to be in accordance with international standards and meet the expectations of experts. This recognition motivates us to continue improving our output to reflect the evolving needs of the professional world.

   We would like to respond to some comments comprising (a) overlap course in Ba and Ma, (b) student workload, (c) exposure to Ma Biophysics, (d) display format of the Ma Biophysics curriculum on the website, (e) the internship program, (f) English language skill improvement, (g) student mobility, and (h) thesis credit. Below, we provide our comprehensive response to each comment.

   a. An overlapping course in Ba Physics and Ma Biophysics
      We will revise the curriculum by advancing the content to fulfill the master degree requirements. The repetition of modern physics material from the Bachelor's programme will be addressed in the next 2025 curriculum by providing an additional matriculation program for non-physics background students.

   b. Student workload
      MBKM curriculum requires students to take some off campus activities. These can be conducted anytime. Therefore, study program needs to allocate particular semesters for students to claim their activities as Enrichment Courses. For this reason, study load at these two semesters is apparently high.. In addition, a Thematic Community Service, an IPB mandatory activity,

conducted at semester break between semester 6 and 7 needs to be claimed at Semester 7. With this reason, during experts meeting, the students commented that the workload at this semester is doable.

However, we agree that we need to monitor the workload as suggested by the experts. This will also be an important consideration in the curriculum renewal process planned for 2025, with the aim of balancing theoretical and practical courses to reduce the pressure that students may feel in those semesters. We greatly appreciate the attention and recommendations given.

c. Exposure to Ma Biophysics
In response to the still low number of new student registrations, we will design a more targeted promotional program, for example through open house activities, information via website and social media, approaches to research institutions and by strengthening the fast track program for our undergraduate graduates.

d. Display format of the Ma Biophysics curriculum on the website
The Study Program has updated the information on the website regarding the Master's Program curriculum, including the presentation of modules/units in chronological order per semester as suggested. We hope that this update can facilitate understanding for stakeholders. (https://physics.ipb.ac.id/master-in-biophysics/#curriculum1)

e. Improvement of project management and communication skills
To improve project management and communication skills of students, the study program will increase engagement with alumni and industry in several ways: 1. Inviting alumni to share their knowledge of communication and project management skills through IPB Physics Alumni Talk (https://www.instagram.com/fis_ipb/p/DCZEkWezhW-/). 2. Inviting practitioners from industry to share their experiences in project management. 3. Supporting student association activities, such as: physics expo, physics goes to school, and physics competitions.

f. English language skill improvement

To increase the English language skill of our student some activities have been planned:

1. Organizing Student English Club. The Department of Physics has initiated an English Club (PEACE: Physics Enthusiast and Conversation in English) through coordination with student representatives. The first meeting is scheduled for November 18, 2024, focusing on conversation to increase English language confidence. Activities will include simulations of scholarship and job interviews, introduction to foreign cultures, and discussions on physics developments through journals/magazines.
2. Encouraging student to present their project orally in English (course projects, capstone projects, final year project) by giving them extra credit points
3. Encouraging students to write their undergraduate or graduate thesis in English by giving them extra credit points.

g. Student mobility

To increase the mobility of students we consider the following attempts:

1. Providing mobility opportunities information through several forms: website, social media, and announcement board. (https://www.instagram.com/p/DBLyl7YTU3m/).
2. Increasing communication with the international education office of IPB to get the recent information regarding international student mobility.
3. Student involvement in overseas research collaboration conducted by faculties of Department of Physics.

h. Thesis credit of Ma Biophysics

The current structure of curriculum adopted by Ma Biophysics IPB is based on national regulation. However, in its implementation, the six credit unit (SKS) of the thesis include the research activities: learning the idea, learning the tools, exploring state of the art, and solving the problem, which will be acknowledged in the diploma supplement. In the incoming new national regulation on master programs, the workload will be significantly increased, especially for the proportion of the thesis.

i. Workload survey: time spent by student

We agree that the indicator is still too general and does not reflect the range of deviation clearly. As an improvement, we will revise the survey in the future. Specifically, the indicator will be reviewed and considered to be broken down into at least two or more detailed time periods. This way, the survey can provide more specific and accurate information regarding deviations from the workload calculation, making it more useful in evaluating and improving the learning process.

2. Exam: System, Concept, and Organization

We appreciate that our exam system and implementation criteria meet international standards and experts' expectations.

3. Resources

We are grateful to the experts for positively evaluating our academic staff's qualifications and dedication to delivering a high-quality education. We will continue to support our staff in developing their academic and professional career.

4. Transparency and Documentation

Thank you to the expert team for constructive feedback on our supporting documentation and module guides. We greatly appreciate the attention paid to these important aspects of presenting academic information. In the following response, we outline the steps we have taken and will take to address the suggestions made to ensure transparency, accessibility, and quality of documentation in line with ASIIN accreditation standards.

a. We have updated the handbook modules for several courses such as Colloquium, Capstone in Physics and Final Project in the Undergraduate program and Graduate School Seminar (Elective Course), Colloquium, Seminar, Thesis in the Master program and available on the website (https://physics.ipb.ac.id/wp-content/uploads/2024/11/Module-Handbook-Ba-Physics-full.pdf and https://physics.ipb.ac.id/wp-content/uploads/2024/11/Module-Handbook-Ma-Biophysics-11.pdf)

b. Based on expert advice, we have combined the first year of study module course with other undergraduate BA Physics courses into one module handbook to improve information unity.
c. Based on the experts' suggestions, we have combined the first-year module courses with other courses in one module handbook to provide a complete overview of the courses available in the Ba of Physics program. The update also includes the addition of a table of contents linked to the descriptions, a foreword and a chronological order of course descriptions following the expert's recommendations. The updated module handbook is available on the website.
d. We will revise the diploma supplement format in accordance with the ECTS Users' Guide format to improve the clarity of individual performance information so that it is useful for external stakeholders.

5. Quality Management: Quality Assessment and Development

We are happy to receive your positive feedback on our programmes' quality assurance system. We will continue to uphold our high management quality standards to ensure sustained programme excellence.

We would like to address some comments related to (a) students and alumni privacy and (b) alumni involvement with Dept. of Physics and study programmes.

a. Students and alumni comments privacy
We have implemented anonymous comments on our website to protect the privacy of our students and alumni when they share their thoughts on our programs (https://physics.ipb.ac.id/ug-program/academic-evaluations/).

b. Alumni involvement with Department of Physics and study programmes
We will elevate the intensive synergy between alumni and the Dept. of Physics. In the short term, we have initiated the alumni talk program as a sharing session after campus life (https://www.instagram.com/fis_ipb/p/DCZE-kWezhW-/ and https://www.instagram.com/p/DBLyl7YTU3m/). In the long term, we will enhance the involvement of alumni from the industry through collaboration in (a) designing new curriculum, (b) student internships, and (c) research and product commercialization.

F Summary: Expert recommendations (21.11.2024)

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

Degree Programme	ASIIN-seal	Maximum duration of accreditation
Ba Physics	With requirements for one year	30.09.2029
Ma Biophysics	With requirements for one year	30.09.2029

Requirements

For both degree programmes

A 1. (ASIIN 4.2) Clearly identify individual student performance in the Diploma Supplement by adding a grade distribution to the marks and rankings. In addition, information on the main features of the Indonesian higher education system should be added.

For the Master programme

A 2. (ASIIN 1.5) Ensure that the student workload for the Master thesis is adequately documented, for instance in the Diploma Supplement.

Recommendations

For both degree programmes

For the Bachelor programme

E 1. (ASIIN 1.3, 3.3) It is recommended that the department's laboratory facilities be further expanded in order to consistently strengthen the high quality of the practical parts of the curriculum.

For the Master programme

E 2. (ASIIN 1.3) It is recommended taking efforts to avoid the repetition of Bachelor course contents of modern physics in the programme.

G Comment of the Technical Committee 13 [Physics] (21.11.2024)

Assessment and analysis for the award of the ASIIN seal:

The TC discusses the procedures, in particular the recommendation E2. Mr Neu and Mr. Ingold explain that it refers to one course in quantum mechanics in the Master programme of Biophysics in which in the first half of the semester material on a Bachelor's level is repeated so that students coming from other subjects can follow the advanced content. The experts find this point understandable, but feel that the Master's curriculum should prioritise the provision of advanced subjects, rather than repeat undergraduate content. They suggested to introduce an additional short course for non-physicists.

The Technical Committee 13 – Physics recommends the award of the seals as follows:

Degree Programme	**ASIIN-seal**	**Maximum duration of accreditation**
Ba Physics	With requirements for one year	30.09.2030
Ma Biophysics	With requirements for one year	30.09.2030

H Decision of the Accreditation Commission (06.12.2024)

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.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Maximum duration of accreditation
Ba Physics	With requirements for one year	30.09.2029
Ma Biophysics	With requirements for one year	30.09.2029

Requirements

For both degree programmes

A 1. (ASIIN 4.2) Clearly identify individual student performance in the Diploma Supplement by adding a grade distribution to the marks and rankings. In addition, information on the main features of the Indonesian higher education system should be added.

For the Master programme

A 2. (ASIIN 1.5) Ensure that the student workload for the Master thesis is adequately documented, for instance in the Diploma Supplement.

Recommendations

For the Bachelor programme

E 1. (ASIIN 1.3, 3.3) It is recommended that the department's laboratory facilities be further expanded in order to consistently strengthen the high quality of the practical parts of the curriculum.

For the Master programme

E 2. (ASIIN 1.3) It is recommended taking efforts to avoid the repetition of Bachelor course contents of modern physics in the programme.

Appendix: Programme Learning Outcomes and Curricula

According to the SAR, the following **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme in Physics and the Master's degree programme in Biophysics:

Ba Physics	Ma Biophysics
1. Mastering knowledge of the concepts of classical physics and modern physics	1. Able to analyze molecular biology systems using Physics concepts.
2. Able to solve basic problems in classical physics using the principles of mechanics, thermodynamics, electrodynamics and waves	2. Able to analyze the properties of advanced materials based on natural materials and other nature inspired materials
3. Able to use analysis tools including mathematics, statistics and computation to solve physics problems.	3. Able to analyze complex biophysical systems.
4. Able to use modern measurement tools and apply basic experimental principles	4. Able to apply computational and experimental physics methods.
5. Able to communicate both spoken and written in expressing ideas regarding to problem solving and using basic principles of classical physics and modern physics	5. Able to design and conduct interdisciplinary research.
6. Able to work effectively both individually and in groups.	6. Able to communicate effectively both written and spoken.
7. Able to apply his/her knowledge in the field of physics to a broader field such as life sciences	7. Able to work individually and in groups.
8. Able to meet the learning outcomes in the aspects of attitude and general skills set by SN-DIKTI	8. Able to Meet the elements of general attitude and skills according to SN-Dikti

The following **curriculum** for the Bachelor's degree programme Physics is presented:

Appendix 1.3.2.K2020 Curriculum of IPB University Bachelor Degree Program in Physics

Code	Course Subjects	Credit (SKS)	Credit (ECTS)	Category
Semester 1				
IPB100	Religion	3(2-1)]	4.5(3-1.5)	CCC
FIS104	Physics of Science and Technology	3(2-1)	4.5(3-1.5)	CCC
IPB10C	Innovative Agriculture	2(2-0)	3(3-0)	CCC
MAT102	Math and Logical Thinking	3(2-1)	4.5(3-1.5)	CCC
IPB106	Indonesian Language	2(1-1)	3(1.5-1.5)	CCC
IPB112a	Sports and Arts	1(0-1)	1.5(0-1.5)	CCC
EKO101	Economics	2(2-0)	3(3-0)	CCC
KPM131	Sociology	2(2-0)	3(3-0)	CCC
	subtotal Credits	**18**	**27**	
Semester 2				
KIM104	Chemistry of Science and Technology	3(2-1)	4.5(3-1.5)	CCC
IPB111	Pancasila Education	1(1-0)	1.5(1.5-0)	CCC
IPB114	National Civic Education	1(1-0)	1.5(1.5-0)	CCC
BIO102	Basic Biology	3(2-1)	4.5(3-1.5)	CCC
IPB108	English Language	2(1-1)	3(1.5-1.5)	CCC
MAT103	Calculus 1	3(2-1)	4.5(3-1.5)	FCC
STA111	Statistics and Data Analysis	3(3-0)	4.5(4.5-0)	CCC
KOM100	Computational Thinking	2(2-0)	3(3-0)	CCC
	subtotal Credits	**18**	**27**	
Semester 3				
FIS1201	Newtonian Mechanics	3(2-1)	4.5(3-1.5)	ACC
FIS1203	Mathematical Physics	3(2-1)	4.5(3-1.5)	ACC
FIS1205	Analog Electronics	2(1-1)	3(1.5-1.5)	ACC
FIS1207	Thermodynamics	3(2-1)	4.5(3-1.5)	ACC
FIS1209	Waves	3(2-1)	4.5(3-1.5)	ACC
FIS120B	Electrostatics	3(2-1)	4.5(3-1.5)	ACC
	subtotal Credits	**17**	25.5	
Semester 4				
FIS1202	Lagrange-Hamilton Mechanics	3(2-1)	4.5(3-1.5)	ACC

FIS1206	Advanced Mathematical Physics	3(2-1)	4.5(3-1.5)	ACC
FIS1208	Digital Electronics	2(1-1)	3(1.5-1.5)	ACC
FIS1204	Computational Physics	2(1-1)	3(1.5-1.5)	ACC
FIS1282	Advanced Physics Experiments	2(1-1)	3(1.5-1.5)	IC
FIS1292	Biophysics	2(2-0)	3(3-0)	IC
FIS120C	Electrodynamics	3(2-1)	4.5(3-1.5)	ACC
	subtotal Credits	**17**	25.5	
		Semester 5		
FIS1301	Quantum Physics	3(2-1)	4.5(3-1.5)	ACC
FIS1303	Statistical Physics	3(2-1)	4.5(3-1.5)	ACC
FIS1381	Optics and Photonics	2(2-0)	3(3-0)	IC
FIS1385	Internet-based Instrumentation Systems	2(1-1)	3(1.5-1.5)	IC
FIS1371	Physics of Complex Systems	2(2-0)	3(3-0)	IC
FIS1393	Biomaterials	2(2-0)	3(3-0)	IC
FIS1383	Material Characterization Methods	2(1-1)	3(1.5-1.5)	IC
FIS1387	Sensors and Transducers	2(1-1)	3(1.5-1.5)	IC
	subtotal Credits	**18**	27	
		Semester 6		
FIS1372	Physics of Condensed Matter	3(2-1)	4.5(3-1.5)	IC
FIS1374	Theory of Relativity	2(2-0)	3(3-0)	IC
FIS137A	Advanced Quantum Physics	3(2-1)	4.5(3-1.5)	IC
FIS137C	Atomic and Molecular Physics	2(2-0)	3(3-0)	IC
FIS1386	Nanophysics	2(2-0)	3(3-0)	IC
FIS137E	Nuclear and Particle Physics	2(2-0)	3(3-0)	IC
FIS1358	Physics Capstone 1	4(0-4)	6(0-6)	CAP/FYP
FIS135A	Physics Scientific Writing Methods	1(1-0)	1.5(1.5-0)	CAP/FYP
	Enrichment Course	3	4.5	EC
	subtotal Credits	**22**	33	
		Semester 7		
IPB400	Thematic Community Services/Kuliah Kerja Nyata Tematik (KKN-T)	4(0-4)	6(0-6)	CAP/FYP/KKNT
	Enrichment Course	18	27	EC
FIS1461	Colloquium	1(0-1)	1.5(1.5-0)	CAP/FYP
	subtotal Credits	**23**	34.5	
		Semester 8		
FIS1452	Capstone Physics 2	4(0-4)	6(0-6)	CAP/FYP
FIS1462	Seminar	1(0-1)	1.5(1.5-0)	CAP/FYP
FIS1464	Tugas Akhir (Final Year Project)	6(0-6)	9(0-9)	CAP/FYP
	subtotal Credits	**11**	16.5	
	TOTAL Credits	**144**	**216**	

The following **curriculum** for the Master's degree programme Biophysics is presented:

Appendix 1.3.4 K2020 Curriculum of IPB University of Master Degree in Biophysics

Code	Course Subjects	Credit (SKS)	Credit (ECTS)	Category
	Semester 1			
BFS1501	Biophysics Research Methods	3(2-1)	4.5(3-1.5)	CC
STA1514	Statistics	3(2-1)	4.5(3-1.5)	FC
BFS1502	Orbital and Molecular Quantum Theory	2(2-0)	3(3-0)	FC
BFS1503	Thermal Biophysics	2(2-0)	3(3-0)	FC
BFS1504	Bioelectromagnetism	2(2-0)	3(3-0)	FC
	subtotal Credits	**12**	**18**	
	Semester 2			
BFS1505	Membrane and Cell Biophysics	2(2-0)	3(3-0)	ACC
BFS1506	Biocompatible Materials	2(2-0)	3(3-0)	ACC
BFS1507	Biophysics and Complexity	2(2-0)	3(3-0)	ACC
BFS1591	Proposal	2(0-2)	3(0-3)	FYP
BFS1592	Colloquium	1(0-1)	1.5(0-1.5)	FYP
	subtotal Credits	**9**	**13.5**	
	Semester 3			
BFS150A	Characterization Methods in Biophysics	2(1-1)	3(1.5-1.5)	IC
BFS150B	Biophysical Modeling	2(2-0)	3(3-0)	IC
BFS150C	Contemporary Biophysics	2(2-0)	3(3-0)	IC
BFS150D	Bioinspired Materials	2(2-0)	3(3-0)	IC
BFS150E	Bioelectronics and Biophotonics	2(1-1)	3(1.5-1.5)	IC
BFS150F	Surface Physics	2(2-0)	3(3-0)	IC
BFS150G	Environmental Biophysics	2(2-0)	3(3-0)	IC
BFS150H	Radiation Biophysics	2(2-0)	3(3-0)	IC
BFS150I	Protein Physics	2(2-0)	3(3-0)	IC
BFS150J	Sustainable Energy Physics	2(2-0)	3(3-0)	IC
	Min ICC Credits	**4**	**6**	
	Semester 4			
PPS1590	SpS seminar (TA series)	1-M	1.5	EC
BFS1593	Thesis	6(0-6)	9(0-9)	FYP
	Publication * choose one			
PPS1692	National Publication	2(0-2)	3(0-3)	FYP
PPS1695	International Scientific Publication	3(0-3)	4.5(0-4.5)	FYP
PPS1698	Publication in International Seminar Proceedings	2(0-2)	3(0-3)	FYP
BFS1594	Thesis examination	2(0-2)	3(0-3)	FYP
Total min graduation credits		**40**	**60**	