ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Physics
Chemistry

Master's Degree Programmes
Physics
Chemistry

Provided by
Institut Teknologi Sepuluh Nopember

Version: 28 March 2023

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A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Sarjana Fisika (S1)	Bachelor of Physics	ASIIN	/	13
Sarjana Kimia (S1)	Bachelor of Chemistry	ASIIN	/	09
Magister Fisika (S2)	Master of Physics	ASIIN	/	13
Magister Kimia (S2)	Master of Chemistry	ASIIN	/	09
Date of the contract: 01.07.2021 **Submission of the final version of the self-assessment report:** 22.05.2021 **Date of the onsite visit:** 08.-10.09.2021 **Via videoconference**				
Peer panel: Prof. Dr. Hans-Joachim Galla, University of Muenster Prof. Dr. Stefan Roth, RWTH Aachen University Prof. Dr. Arno Schindlmayr, Paderborn University Dr. Nikolaus Nestle, BASF Felix Cahyadi, Student at Institut Teknologi Bandung				
Representative of the ASIIN headquarter: Jan Philipp Engelmann				
Responsible decision-making committee: Accreditation Commission				

[1] ASIIN Seal for degree programmes.
[2] TC: Technical Committee for the following subject areas: TC 09 - Chemistry, Pharmacy; TC 13 - Physics.

Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of Technical Committee 09 – Chemistry, Pharmacy as of March 29, 2019 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
Physics	S. Si./ B.Sc.	/	6	Full time	/	8 semesters	150 SKS (around 240 ECTS)	Annually in June
Chemistry	S. Si./ B.Sc.	/	6	Full time	/	8 semesters	150 SKS (around 240 ECTS)	Annually in June
Physics	M. Si./ M. Sc.	/	7	Full time	/	4 semesters	74 SKS (around 118 ECTS)	Bi-annually in June and November
Chemistry	M. Si./ M. Sc.	/	7	Full time	/	4 semesters	74 SKS (around 118 ECTS)	Bi-annually in June and November

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

"Programme Educational Objectives (PEOs) of the Undergraduate / Bachelor Study Programme of Physics (BoP) at DoP-ITS Surabaya are defined as the following:

1) Producing devout, ethical, and responsible individuals who are able to demonstrate leadership and cooperation in the global world (**PEO-1**).

2) Producing graduates who at the beginning of their career become professionals as educators, researchers, practitioners, and entrepreneurs by using their skills and knowledge in the field of physics, which includes theoretical physics, advanced materials, instrumentation physics, optoelectronics and applied electromagnetics, geophysics, and medical physics and biophysics, to be applied in the real world of work (**PEO-2**).

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

3) Producing professional individuals who are able to communicate in writing or orally in teams or as citizens of the world using international languages (**PEO-3**).

4) Producing individuals who are able to develop themselves to always learn all the time through further studies, research, and other activities both at home country and abroad (**PEO-4**).

These objectives are in line with the vision and mission of DoP-ITS in coherence with the vision and mission of F-SCIENTICS and the vision and mission of ITS Surabaya as follows:

The vision of DoP-ITS is to be a centre for education, research, and advancement in Physics and technological applications in regional and international level.

The Mission of DoP-ITS are:

1. Improve employee performance by meeting minimum service standards for routine duties according to Standard Operating Procedures (SOP).

2. Improve and empower management and internal strength.

3. Support management in strengthening international networks and promotions.

4. Develop and implement an innovative-progressive activity agenda that underlies ITS efforts to gain international recognition.

The Objectives of DoP-ITS can be described briefly as the following:

1. Producing graduates who are devoted to God Almighty, virtuous, have broad insight and confidence, as high quality and independent graduates of Physics; have a high commitment and work ethic; and able to compete in global competition level.

2. Developing and disseminating physics, as well as its application to support national development in improving people's living standards and to enrich the treasures of physics.

3. Increasing the role of DoP-ITS as a centre for Physics services and its application for the education community, industrial society and the wider community in accordance with their needs; in the form of research, training, consulting and other services in the field of physics.

4. Improving management's ability to create an academic and scientific atmosphere that supports efforts to improve the quality of human resources, education and development of physics and its application.

5. Developing the relevance of education, research and services in the field of physics in accordance with the needs of society by expanding the network through the use of information and communication technology.

6. Preserving the implementation of the so-called *Tri Dharma Perguruan Tinggi* or "Three Obligations of Higher Education" activities based on values, morals and academic ethics towards a dignified standard of life."

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

"Vision:

- The Chemistry Department being a chemistry learning center which creates graduates with international qualifications as an agent of developing the knowledge of science and technology.

Mission :

- To carry out an efficient high level of education in the field of chemistry up to the stage of postgraduate, in order to produce graduates who are approved and known at the international level.
- To perform innovative and creative researches to develop the knowledge of chemistry.
- To organize activities by providing the society services that are connected with chemistry.
- To organize activities by socializing chemistry and the capability of Chemistry ITS Department.
- To uphold and maintain the values of academic, moral and ethics in order to achieve a better quality of life.

After the formulation process, the Program Education Objectives (PEOs) of BoC state and describe the expected accomplishments of graduates, as mentioned bellow:

- ❖ To produce graduates who able to use their knowledge, skills, and competence in the area of chemistry for their professional career at national and international level (PEO 1).
- ❖ To produce graduates who able to have good quality as an individual, and as a member or leader in diverse teams, in interdisciplinary and multidisciplinary settings (PEO 2).
- ❖ To produce graduates who can follow the ethical principles and responsibilities of a chemist to serve the society and environment (PEO 3)"

For the Master's degree programme Physics the institution has presented the following profile in the self-assessment report:

“The master of physics programme design (competence profile and structure of the curriculum) meets the discipline requirements. According to the qualification framework (*Kerangka Kualifikasi Nasional Indonesia* (KKNI)), it complies with the required level of study in Level 7. The educational objectives are outlined by describing the learning outcomes that graduates require for practising their profession. Competences are these learning outcomes.

They are a combination of knowledge, skills (intellectual, practical, and social), attitudes and values that enable individuals to carry out tasks and solve problems in specific academic, professional or social settings. Under the framework, physics masters graduates are expected to achieve the following objective within a few years of graduation:

1. The graduates develop their professional careers in various fields of job position in the development and application of physics.

2. They trust and respect others among the team members.

3. Researchers who can carry out independent research and can develop innovative and latest scientific works and/or pursuing their advanced degree.”

For the Master’s degree programme Chemistry the institution has presented the following profile in the self-assessment report based on the vision and mission of the department of chemistry (see above):

“Finally, the PEOs of the MOC state and describe the expected accomplishments of graduates, as mentioned bellow.

❖ Graduates who able to use their knowledge, skills, and competence in the area of chemistry for their professional career (PEO1).

❖ Graduates who able to develop themselves through further studies (doctoral degree) both domestic and abroad by training or research (PEO2)

❖ Graduates who can carry out their profession responsibly, ethically, have leadership characteristics and are able to develop a network system (PEO3)”

C Peer Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Websites
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The auditors base their assessment on the learning outcomes as detailed in the Self-Assessment Report of the four degree programmes under review. They refer to the Subject-Specific Criteria (SSC) of the Technical Committees Physics and Chemistry as a basis for judging whether the intended learning outcomes of the programmes as defined by ITS correspond with the competences as outlined by the SSC.

ITS has described and published programme educational objectives (PEOs) and programme learning outcomes (PLOs) for each of the four degree programmes. While the PEOs are developed based on the vision and mission of the university as well as the respective faculty and are rather general and concise, the PLOs describe in greater detail the competences, which the students should acquire during their studies. By means of being published on the websites of the degree programmes, the PEOs and PLOs are easily accessible for students as well as other stakeholders. Furthermore, there are regular revision processes in place that takes into account feedback by employers and alumni. A minor curriculum adjustment is done every year whereas a major revision including consultations of stakeholders takes place every four years.

The peers learn the students of all programmes are supposed to acquire certain attitudes, for instance responsibility and independence, and general competences such as problem-solving, critical thinking and communication skills. Besides these, the Bachelor's degree

programmes are equipping the students with basic field-specific knowledge and capabilities in physics and chemistry, respectively. The Master's degree programmes aim at consolidating and enhancing these competences in order to qualify the students to conduct research in academia or industry.

In the peers' opinion, the objectives and learning outcomes of all degree programmes are mostly well-written and cover all aspects that can be expected from a programme in the respective field. Only with regards to PLO 3 of the Master of Physics ("Identifying the scientific field of physics as the research topics following the robust road map developed within inter- or multi-disciplinary science and technology") they have difficulties in grasping the exact meaning. Therefore, they would appreciate it if ITS could choose a more precise wording for this PLO.

The peers see that all four degree programmes are quite broad, regarding the learning outcomes as well as the curricula (see 1.3), covering a wide range of fields within both disciplines. While they consider this a legitimate choice, it might be worthwhile to think about developing a more specific profile in accordance with the departments' research activities and ITS's general strategy. The university's emphasis on sustainable development could provide a useful reference point.

During the audit, the peers discuss with students, teachers, and alumni where the graduates can find suitable jobs. They learn that graduates mostly work as researchers, on various positions in industry, and as teachers. During their studies, they acquire the necessary competences to find adequate professional positions in these fields. They are generally satisfied with their job perspectives. As the representatives of professional practice confirm, the graduates are very welcome on the labour market due to their specialist knowledge as well as their ability to work independently.

In summary, the auditors are convinced that the intended qualification profiles all four programmes under review allow students to take up an occupation, which corresponds to their qualification. The peers agree that the qualification objectives of all programmes are adequate to level 6 or level 7 of the European Qualification Framework respectively, according to their status as Bachelor's and Master's programmes, and to the respective ASIIN Subject-Specific Criteria of the Technical Committees Physics and Chemistry.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report
- Diploma Supplements

Preliminary assessment and analysis of the peers:
The titles of the degree programmes follow the rules for naming study programmes set by the Indonesian Ministry of Education. Sarjana/S1 indicates undergraduate programmes, Magister/S2 graduate programmes. The peers agree that the names of all four degree programmes adequately reflect their intended aims and learning outcomes.

Criterion 1.3 Curriculum

Evidence:

- Study plans of the degree programmes
- Module descriptions
- Objective-module matrices
- Website
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The curricula of the degree programmes are designed to comply with the programme objectives and learning outcomes and they are subject to constant revision processes (cf. chapter 1.1). As such, the curricula are reviewed regularly and commented on by students and teachers as well as by external stakeholders such as alumni or partners from industry and the private sector. Regular changes are made to ensure that the curricula are up to modern standards.

Both Bachelor's degree programmes mostly contain compulsory courses that cover the fundamentals of Physics and Chemistry respectively. Apart from these scientific courses, they also comprise courses in language (English and Bahasa Indonesia), citizenship values and the Indonesian constitutional principles of Pancasila that are mandatory for all undergraduate programmes in Indonesia.

Besides these and some other courses that teach the students general competences and that lay a common scientific foundation, the majority of the courses of the Bachelor's programme of Physics cover the usual subject areas in accordance with international standards both in theoretical and experimental physics. Moreover, there are mandatory courses in the so-called Expertise Fields, which include specialised areas such as materials science, optoelectronics, medical physics and geophysics. Based on the same general and scientific foundation, the Bachelor's programme of Chemistry contains courses that cover the different areas of chemistry, ranging from a fundamental to an intermediate level. The peers are generally satisfied with the curricula of both programmes and they see that all the important areas of the subjects are covered. At the same time, this breadth entails that for

some fields, only rough overviews can be provided. This is most evident in the case of the expertise fields within the Bachelor's degree programme of Physics, where the small size of the courses only allows conveying basic knowledge of the respective field. The peers understand that this structure is the result of a deliberate and legitimate choice to give the students insights into many different fields. However, ITS might think about facilitating some kind of specialisation already at a Bachelor's level by giving students the opportunity to choose between larger courses or course groups instead of having to take the existing courses from all expertise fields.

The Master's degree programmes focus more strongly on scientific courses and contain a significantly larger degree of elective courses to give the students some room for specialisation. Furthermore, both include some compulsory courses to teach the students additional skills in core subject areas as well as courses in research methods to prepare the students for their Master's theses. The peers appreciate the curricula of the programmes, particularly the wide range of electives.

With regards to the students' practical education, the peers learn that while there are only few dedicated laboratory courses, many courses in all programmes contain some laboratory classes in which the students conduct experiments. These are typically done in groups of 3-5 students under the supervision of 1-2 lecturers for the entire cohort and 1 student assistant per 2-3 groups. The experiments are designed in such a way that the different tasks such as preparation, conduct and data collection are assigned to one student each and that these responsibilities rotate from experiment to experiment. This way, although not every student conducts the entire experiments, they are familiarised with the different tasks that are associated with them. Therefore, the peers are content with this system.

Moreover, the peers discuss with the university about how the students improve their English skills within the programmes. They learn that a certain score at an English test is necessary for graduation at ITS and the university employs several means to have the students reach the needed level. Most of the textbooks are in English, there are some international guest lecturers, trainings for writing papers in English and there is a programme in which the lecturers learn how to teach in English. The peers appreciate these efforts and see that they are already quite effective in some regards. However, they do not comprise active communication, which would be an important supplement. To this end, the peers suggest to offer some courses in English, preferably some of the general courses, for instance on citizenship values or Pancasila. Being able to reflect about these issues in English could be particularly useful for working in international companies or for pursuing further studies abroad.

In summary, the peers conclude that the curricula of all degree programmes under review are generally well-structured and that the students learn the required skills to be qualified for adequate jobs or further education in Indonesia and abroad.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Website
- Discussions during the audit

Preliminary assessment and analysis of the peers:
There are three different paths of admission into the Bachelor's degree programmes:

1. National Selection of Higher Education or University (Seleksi Nasional Masuk Perguruan Tinggi Negeri, SNMPTN), a national admission system, which is based on the academic performance during high school.

2. Joint Selection of Higher Education or University (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN). This national selection is based on the results of a test (UTBK), which is held every year for university candidates. It is a nationwide written test (subjects: mathematics, Bahasa Indonesia, English, physics, chemistry, biology, economics, history, sociology, and geography).

3. Independent Selection (Seleksi Kemitraan Mandiri, SKM): Students are selected based on criteria determined by ITS itself. It mainly follows the results of UTBK, but also considers other criteria such as achievements and motivation of the students.

For each academic year, the university determines the ratio of students admitted through these three ways.

For the Master's degree programmes, applicants need to have obtained a Bachelor's degree with a minimum GPA of 3.0 from a programme accredited A or B by the national Indonesia accreditation agency, pass the entrance exam, submit two letters of recommendation and they need to have full colour-vision. According to the Self-Assessment Report, the requirement for colour-vision is also applied in the Bachelor of Chemistry.

While the admission criteria generally appear clear and understandable to the peers, they wonder about the need for colour-vision and learn that ITS indeed conducts tests in this regard. The university elaborates that they consider colour-vision necessary for certain experiments as well as to discern colour codes for chemicals. The peers, however, are convinced that with modern tools and technology, colour-vision is no longer an important skill

even in chemistry laboratories. Regarding the study programmes at hand, it is even less of an issue as the experiments are conducted in groups and the colour-blindness of one student can be easily compensated by the other group members. Hence, they consider this admission criterion needlessly restrictive and ask ITS to drop it. Furthermore, the peers are surprised that according to the Self-Assessment Report, this admission criterion is only relevant for the Master's programmes and the Bachelor of Chemistry and they would like to know whether this is correct or whether it is also applied for the Bachelor of Physics. Moreover, they kindly ask the university to clarify if there are any other admission barriers for applicants with certain disabilities.

The tuition fees for the programmes are determined based on the income of the students' parents in three levels, ranging from 7,500.000 to 12,500.000 Rp (around 450 to 750 €) per semester. There are various options for scholarships that cover the tuition fees.

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

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

The peers thank ITS for providing additional information on the policy regarding people with colour-blindness. However, they are not convinced that the mentioned examples reasonably justify the current rule not to admit students with colour-blindness. Degree programmes of Chemistry and Physics all over the world successfully manage to integrate students with colour-blindness and so the peers are optimistic that ITS will be able to do so as well.

They appreciate that there are no admission barriers for people with other handicaps, but they still request ITS making the programmes also accessible to people with colour-blindness.

The peers consider criterion 1 partly fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Objective-Modules-Matrices
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The Bachelor's programmes are designed for four years and the students need to achieve 150 Indonesian Credit Points (SKS, which is roughly equivalent to 240 ECTS; cf. chapter 2.2 for more details). Roughly 90 % of these CPs are awarded for compulsory, around 10 % for elective courses. The Master's programmes encompass 74 SKS (around 118 ECTS) within two years, around two thirds of these for compulsory courses, around one third for electives. Each semester is equivalent to 16 weeks, including 13 weeks of learning activities and 3 weeks of evaluation (midterm and final exams).

After analysing the module descriptions and the study plans, the peers confirm that all degree programmes under review are divided into modules and that each module is a sum of coherent teaching and learning units. All programmes contain adequate practical elements and allow the students to define individual focuses through broad ranges of electives (see chapter 1.3 for more details). The students confirm that the structure of the programme allows them to reach the learning outcomes within the regular duration. For the Chemistry programmes, ITS has provided data on the average length of study which is only slightly higher than four years for the Bachelor's and two years for the Master's programme. Thus, the peers are convinced that the structure of the programmes is reasonable. They cannot detect any problems within the Physics programmes in this regard, but nonetheless ask ITS to provide data about the average length of study and the ratio of drop-outs as well.

Of the 74 SKS for the Master's programmes, 38 are related to so-called "Additional activities". These partly consist of additional courses, partly of activities related to the thesis, namely literature review, support work, and publication. Besides the list of these activities, the peers do not have any further information about these activities. Therefore, they ask ITS to provide more information about the content of these activities, preferably module descriptions. These should also clarify what exactly the students have to do in the various activities and if and how they are examined and graded.

According to the Self-Assessment Report, as a requirement for all programmes, students have to prove a certain level of English skills through TOEFL and for the Bachelor's programmes, they need extracurricular activities amounting to 2 SKS to be recognised by the university. As these two elements are mandatory elements of the curricula and credit points are awarded for these, they need to be incorporated into the module handbook. These descriptions should include the usual information and particularly detail the exact requirements for the award of the credit points.

International Mobility

The Self-Assessment Report as well as the discussions make it very clear that international recognition is one of ITS's primary goals for the next years. The peers point out that international mobility, with regard to the lecturers as well as to the students, is a key factor in these efforts.

The peers learn that the university already provides various mobility opportunities for students. These include semesters abroad, short programmes, internships, and international conferences. To foster these, there are cooperation agreements with 653 partner institutions worldwide, with a certain focus on Asia, but also including many institutions in Europe and North America. Partly due to the Corona pandemic, the number of students that participated in mobility programmes in 2020 and 2021 was relatively low, but is expected to markedly increase after the pandemic. An international office has been established in order to coordinate ITS's efforts and to support the students in the planning and administration of international mobility. Moreover, the university provides scholarships for international mobility programmes.

Qualifications obtained at other universities in Indonesia or abroad are recognised in line with the courses at ITS. Before a stay abroad, the university concludes a learning agreement with the respective student to ensure that the courses taken are relevant to the study programme and can thus be recognised. As the students confirm, there are no problems with credit transfer or the organisation of student mobility. They emphasise that the international office as well as their academic advisors are eager to support them and to find adequate study programmes and courses.

The peers appreciate the efforts undertaken by the university to foster student mobility. They also remark that many of the programmes' graduates pursue some kind of further education, for instance a Master's degree or a PhD, abroad. Consequently, the peers are very satisfied with the structures and support mechanisms for international mobility.

Criterion 2.2 Workload and credits

Evidence:

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

Preliminary assessment and analysis of the peers:
Based on the National Standards for Higher Education of Indonesia (SNPT), all four degree programmes under review use a credit point system called SKS. According to the legal requirements, an undergraduate programme in Indonesia can have between 144 and 160 SKS and a graduate programme has to include at least 36 SKS. The Bachelor's programmes under review both encompass 150 SKS, while the Master's programmes have 74 SKS.

1 SKS of academic load is equivalent to 170 minutes per semester week. For lectures, tutorials and similar classes, this means 50 minutes of face-to-face activity, 60 minutes of structured tasks and 60 minutes of independent learning per semester week, whereas for laboratory work and internships, 1 SKS equals 170 minutes of the respective activity per semester week. The details and the students' total workload should be described in the module descriptions, but this is currently not the case for the Bachelor's programme of Chemistry and the Master's programme of Physics (cf. chapter 5.1). Regarding the conversion from SKS to ECTS, ITS explains that 1 SKS equals 45.3 hours and thus 1.6 ECTS, based on 28.3 hours per ECTS. The peers acknowledge that a credit point system based on the students' workload is in place.

With the exception of the last semesters of the Bachelor's programme of Chemistry, the workload is spread relatively evenly in all programmes. However, the effective number of SKS the students can take depends on their achievements in the previous semester. In the Bachelor's programmes, if their Grade Point Average is less than 2.5, they can take up to 18, between 2.5 and 3.0 up to 20, between 3.0 and 3.5 up to 22 and above 3.5 up to 24 SKS in one semester. In the Master's programmes, they can take up to 12 SKS if their GPA is less than 3 and up to 15 SKS otherwise. Here, it appears as if only the 36 SKS of regular courses are considered, not the 38 SKS of "Additional activities" (cf. chapter 2.1). This mechanism is supposed to ensure that the students can really handle the workload. It also means that students can finish their studies in less than 8 semesters, although this is relatively rare due to the high workload in general. The peers are satisfied with the distribution of the workload and they see that there are no structural peaks.

As has already been mentioned, based on the available data for the Chemistry programmes, the vast majority of the students manage to finish their studies on time. The

students confirm that the overall workload is high but manageable. As the lecturers explain, the workload for assignments and individual study in each course is estimated by the lecturers based on their experience. There is, however, currently no mechanism in place to ensure that this estimated workload is realistic and to prevent students from having to invest disproportional effort into certain courses. Thus, the peers recommend to establish a system to monitor the actual student workload in the individual modules. This could, for instance, be incorporated into the existing course evaluation surveys.

Criterion 2.3 Teaching methodology

Evidence:

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

Preliminary assessment and analysis of the peers:
As ITS explains in the Self-Assessment Report, various student-centred learning methods are utilised in the degree programmes under review. Through the Indonesian regulations on credit points (see chapter 2.2), an adequate balance between face-to-face activities and independent learning is already ensured for all courses. Besides the regular lectures, cooperative learning, project- and problem-based learning, inquiry and experiments are used to a considerable degree. The students confirm that these methods are actually used in the courses and that they are highly satisfied with the variety of teaching methods, which support them in achieving the learning outcomes. The teaching and learning is supported by a broad range of media, both traditional (books, papers) and online (videos, presentations etc.). The university's online learning management system supports teachers and students in communicating and disseminating learning material. In the course of the Covid-19 pandemic, the university has swiftly switched to online learning with videoconferences, recorded videos and other media.

The peers consider the teaching methodologies employed in the degree programmes to be diverse, highly interactive and to support reaching the PEOs and PLOs. They are well adapted to the aims and conditions of the individual courses. The peers learn that ITS already plans to have hybrid classes in the near future and they suggest to develop a university-wide concept for hybrid teaching based on the experiences during the pandemic and on the advantages and disadvantages of the different teaching methods.

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Reports
- Website
- Discussions during the audit

Preliminary assessment and analysis of the peers:

In order to support students in completing their studies on time with good achievements, the university and the faculty provide academic and personal support and assistance through various means. The main contact person for every student is their academic advisor, who is assigned to them in their first semester. An academic advisor shall help them develop an adequate schedule for their studies, choose electives according to their skills and interests and support them in case of academic and non-academic problems. Each student usually meets with their academic advisor, who is also responsible for monitoring their study progress, at least twice per semester. The academic advisor also has to approve the student's study plan for the semester. As this might lead to conflicts, the peers inquire about what mechanisms are in place to solve such conflicts. They learn that students can contact the head of their study programme or of the department, but the students as well as the lecturers emphasise that they do not know of any major conflicts.

Furthermore, there is supporting staff in the International Office (cf. chapter 2.1), the Career centre, the scholarship sector and the general academic administration. The career centre regularly organises job fairs, seminars with potential employers, trainings for writing applications etc. in order to support the students in their career planning.

During the discussions, it remains unclear to the peers how students with disabilities are supported. Therefore, they ask ITS for additional information on this point.

Apart from that, the peers conclude that there are enough resources available to provide individual assistance, advice, and support for all students. The support systems help the students to achieve the intended learning outcomes to complete their studies successfully.

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

The peers thank ITS for providing module handbooks of the "Additional Activities" within the Master's degree programmes and for providing information on some ways in which students with disabilities are supported at the faculty.

In the additional module handbooks, the peers notice that the awarded credit points appear to be inconsistent with the rules laid down by ITS. According to these, 1 SKS should be equivalent to 170 minutes of activity per semester week. However, for the "additional activities" considerably more SKS are awarded. Therefore, they urge ITS to correct this information within the revision of the module handbooks (see chapter 5) and to include these activities into the workload monitoring system to be developed.

They consider criterion 2 fulfilled, but recommend to establish a workload monitoring system and to develop a concept for hybrid teaching.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Module descriptions
- ITS Academic regulations
- Sample written exams and final theses

Preliminary assessment and analysis of the peers:
For the examination of the students' achievement, each course has to determine objectives, which support the achievement of the overall learning outcomes of the respective programme. Accordingly, each course must assess whether all defined learning outcomes stated in the module description have been achieved. For this purpose, ITS utilises various types of examination.

In each course, at least two assignments/quizzes, a mid-term and a final examination are employed. There are different assessment methods in the programmes, such as written tests, quizzes, assignments, reports, presentations, and oral examinations. In most courses, mid-term and final exam consist of written tests and additional quizzes or assignments are used. However, the other assessment methods are also used to a significant degree, particularly in seminars and practical classes. The possible types of assessment are specified in the module descriptions, although this information is not included for the Bachelor's programme of Chemistry and for the Master's programme of Physics and has to be added (cf. chapter 5.1).

The final course grade is calculated based on the score of these individual assessments, whereby the lecturer determines the ratio between them in accordance with the Academic

Guidelines. At the first meeting of a course, the students are informed about what exactly is required to pass the module and about how the final grade is determined through the teaching and learning plan. ITS uses a grading system with the grades A, AB, B, BC, C, D and E, where a D (equivalent to a Grade Point of 1) is necessary to pass a module.

The mid-term exams are carried out in the 8th, the final exams in the 15th and 16th week of the semester, whereas the smaller quizzes and assignments take place in the other weeks. The students confirm that they are well-distributed, so that there are no more than a few in any given week and so that the students have enough time to prepare or to work on the assignments. There is a defined process of appeal against the results of examinations that goes through the head of department and of which the students are generally aware. However, the peers learn that during the pandemic and due to exams being conducted remotely, this process often did not work as usual. As the students report, in many cases they did not get back their corrected exams and sometimes not even the grades of the exams, but only of the entire courses. Therefore, they could not check whether the correction was adequate. The peers understand that exams during a pandemic constitute a particular challenge, but they nonetheless consider it necessary that the students receive their corrected exams and their exam results so that they are able to file a complaint.

According to the Self-Assessment Report, there are no specific rules regarding re-sits in case of illness or other legitimate reasons, but lecturers rather have considerable autonomy in handling this. The same holds true for compensation measures for students with disabilities. The peers ask ITS to clarify whether this is actually the case and if so, they ask the university to draft such regulations so that the students' rights are clearly laid down and they can rely on them.

There are special regulations in place for Bachelor's and Master's theses that specify rules about supervision, procedure and other related issues. Amongst other things, it is required for Master's theses to be published either in a national or international SCOPUS-indexed journal or in the proceedings of an international conference. The peers are wondering whether the scientific quality of all theses merits a publication and fear that it might lead to delays in the study progress. During the audit, they learn that the vast majority of students choose to present the results at a conference and that there are several suitable international conferences held in Surabaya in the field of both physics and chemistry. Therefore, the peers conclude that this rule does not lead to delays in graduation. They remain sceptical, however, whether a publication of all theses without exception is necessary and sensible.

Overall and with the exception of the mentioned issues, the peers are satisfied with the regulations of exams in the four degree programmes. They inspect a sample of exams and final theses and are satisfied with the general quality of the samples.

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

The peers thank ITS for providing an official regulation, which specifies that students who could not participate in an exam due to illness or other legitimate reasons have to be given the opportunity of a follow-up exam in the same semester, which the peers appreciate.

They further appreciate that students with disabilities are supported in accordance with their needs, but consider it necessary to establish binding rules for compensation measures for exams on which students can rely. At the moment, the rules state that students with permanent disabilities “have the same rights as students who are not disabled”, but there is no provision to systematically compensate for their handicaps. Depending on the kind of disability, this could include alternative types of examination, more time or other appropriate measures.

Lastly, it has to be ensured that the students receive their corrected exams and their results in case of distant exams. The peers consider criterion 3 partly fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

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

Preliminary assessment and analysis of the peers:

At ITS, the staff members have different academic positions. There are professors, associate professors, assistant professors, and lecturers. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. This relies on regulations by the Indonesian Min-

istry of Education that determines certain minimum credit points of experience for reaching the next level. Every teaching staff has responsibilities in the fields of teaching, research, and community service. Some are furthermore involved in the management of the programmes, the faculty or other university bodies, for which their other responsibilities are reduced.

There are 37 teaching staff for Chemistry (26 with PhD, 11 with Master's degree), and 49 for Physics (36 with PhD, 13 with Master's degree). According to ITS's current policy, all new teaching staff has to have or actively pursue a PhD and additionally, the university encourages the teaching staff with a Master's degree to pursue further qualification in order to obtain a PhD degree. These numbers mean that the ratio between academic staff and students is around 1:3 for both Master's, and around 1:13 for both Bachelor's degree programmes. In addition, the faculty regularly invites visiting lecturers from Indonesia and abroad to facilitate academic exchange. From these numbers as well as the students' feedback, the peers see that the academic staff is well able to fulfil its duties in teaching as well as in the other areas.

Recruiting new teaching staff follows a defined procedure starting with a needs analysis of the degree programme, the proposal for new positions to the university, a public announcement and finally the recruitment based on the results of a basic competence test, a field competence test and an interview.

The academic staff is involved in research projects funded by grants from the Indonesian government, the university itself or other research funds. ITS positions itself as a university with a strong focus on research in science and technology. Given this emphasis, the peers note that the publication record of the academic staff could be improved. A considerable number of papers has been published in predatory journals, which might be a result of certain regulations and incentives focussing on the mere quantity of publications. In order to live up to its own strategic goals, the peers recommend that ITS further strengthen the research of both departments.

Overall, the peers confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programmes.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Staff handbook

- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report, ITS encourages the continuing professional development of its staff. For this purpose, various opportunities are provided. There is a mandatory didactic training for new academic staff that encompasses curriculum design, teaching material, and innovative teaching and learning methods. Moreover, in each semester workshops are held to refresh and to deepen various didactic competences.

All teaching staff are encouraged to study abroad or to participate in international research projects and conferences in order to enhance their knowledge, increase their English proficiency and to build international networks. For this purpose, the university informs about possible scholarships to support academic mobility. Particularly for junior lecturers with a Master's degree, ITS offers systematic training to prepare them for acquiring a PhD abroad, for instance through English courses, information on foreign education systems, administrative support, and supporting (international) research collaborations.

The peers discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at the university, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops or seminars.

The peers appreciate the university's efforts in this regard and consider the support mechanisms for the continuing professional development of the teaching staff adequate and sufficient. They particularly recommend to continue the efforts to strengthen the lecturer`s English skills, as these are a basis for fruitful international exchange and cooperation. The peers strongly endorse ITS's current policy to encourage their teaching staff with a Master's degree to pursue PhD degrees abroad.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report
- Videos and presentation of the facilities
- Discussions during the audit

The university and the faculty are mainly funded by the Indonesian government, through tuition fees and through grants for research projects in collaboration with industry. The figures presented by the university show that the faculty's income is stable and the funding of the degree programmes is secured. The academic staff emphasise that from their point

of view, all four programmes under review receive sufficient funding for teaching and learning activities. The students confirm this positive impression and state their satisfaction with the available resources.

In preparation of the audit, the university provides a number of videos showing the laboratories of the programmes. During the virtual on-site visit, the facilities of all programmes are shown in more detail. The peers notice that the lecture rooms are well equipped. The university has teaching as well as research laboratories for physics and chemistry that feature basic as well as high-quality equipment. As the students confirm, the laboratories are accessible to them for research within the courses, but also for their final projects. The peers do not detect any serious gaps in the available equipment. Nevertheless, for some analytical instrumentation such as NMR the purchase of equipment would be highly desirable. Moreover, the peers cannot make a final assessment of the quality of the technical equipment and the infrastructure on the basis of the videos alone. Not all laboratories are shown in the videos and particularly the safety measures remain partly unclear, for instance regarding the use of safety goggles and gloves, the availability of eye showers, chemical-proof cabinets, and first-aid kits, and concerning the ventilation system (general air exchange rates, fume hoods). Therefore, the peers point out that it is necessary to assess the technical infrastructure, safety measures, and facilities onsite at ITS. This will be done by at least one expert and one ASIIN programme manager in order to ensure that the required safety standards are met. In addition to this on-site assessment, the peers ask ITS to provide or develop a dedicated laboratory safety concept based on a hazard assessment.

The departments' libraries are well equipped with national and international literature. Moreover, staff and students can access e-books and international journals through various subscriptions, not only at the library itself but also via remote access. The students point out that the libraries already close at 4 pm in the afternoon. Notwithstanding the existing opportunities of remote access and virtual literature, the peers notice that this does not ideally fit the students' schedules, as they often have courses from morning until afternoon. Therefore, they recommend to extend the opening hours, so that students can better use the libraries for learning and studying.

In summary, the peer group judges that besides the mentioned restrictions, the available funds, the technical equipment, and the infrastructure comply with the requirements for adequately sustaining the degree programmes.

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

As ITS did not give a statement regarding criterion 4, the peers retain their original assessment. They consider criterion 4 partly fulfilled. The technical infrastructure, safety measures, and facilities have to be inspected onsite and the peers recommend to further strengthen the departments' research, the lecturers' English skills and to extend the library opening hours.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions
- Website

Preliminary assessment and analysis of the peers:
The module handbooks for all four programmes have been published on the university's website and are thus accessible to the students as well as to all stakeholders. The peers observe that they contain information on many important issues such as the intended learning outcomes, the credit points awarded, the main content, prerequisites, and recommended literature.

However, as has already been remarked in several chapters, some information is missing or insufficient. The responsible persons, teaching methods, applicability of the courses, the total workload and its composition, and the possible forms of examination are not given consistently. Therefore, the peers urge ITS to revise the module descriptions to ensure that all necessary information is presented. In addition, the peers note that the reading lists of some module descriptions contain rather old references that might not reflect the current state of the art in these fields in terms of scientific knowledge and didactical presentation. Therefore, they recommend to review the literature lists and, where necessary, to update them with relevant references that are actually used in the courses.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Sample Transcript of Records for each degree programme
- Sample Diploma certificate for each degree programme
- Sample Diploma Supplement for each degree programme

Preliminary assessment and analysis of the peers:
The peers confirm that the students of all four degree programmes under review are awarded a Diploma and a Diploma Supplement in English after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Diploma Supplement contains all necessary information about the degree programme. The Transcript of Records lists all courses that the graduate has completed, the achieved credit points, grades, and cumulative GPA.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Report
- Website

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

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

As ITS did not give a statement regarding criterion 5, the peers retain their original assessment. They consider criterion 5 partly fulfilled. ITS still has to revise the module descriptions in order to include all mandatory information.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- ITS Guidebook on internal quality assurance
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The peers learn that there is an institutional system of quality management aiming at continuously improving the degree programmes. This system relies on internal (SPMI) as well as external (SPME) quality assurance.

SPME focuses on both national and international accreditations. Every degree programme and every Higher Education Institution in Indonesia has to be accredited by the national Accreditation Agency (BAN-PT). ITS as an institution as well as all four degree programmes under review have received the highest accreditation status (A) from BAN-PT.

SMPI encompasses all activities focused on implementing measures for improving the teaching and learning quality at the university. ITS has a Quality Assurance Office (KPM), which conducts regular scans of academic and non-academic quality criteria within the institution. Apart from this office, there are different quality assurance units in place, such as the Faculty Quality Team (TMF), Department Quality Team (TMD), and Degree program Quality Team (TMP). Different measures are taken to gather information about a variety of qualitative aspects of the institution.

On the institutional level, ITS annually carries out an SPMI evaluation of ten standards concerning management, resources, strategic development and quality assurance procedures. The performance of the departments is continuously checked through an information system called SIPMONEV. As has already been mentioned, there is a major curriculum revision process for each programme every four years and a minor one every year (cf. chapter 1). The graduates are followed by ITS through a regular tracer study conducted by the career centre, although the peers note that no results of these studies have been provided for the Bachelor's degree programmes and that the reports are not easily accessible through the website. Internal and external stakeholders give input through these processes in various ways.

Lastly, at the end of each semester, the students are asked to fill out an evaluation survey on each course that they took. It contains several items regarding the quality of the teaching, the learning media, the adequacy of assessment methods and similar issues. Based on the results, a Lecturer Achievement Index (IPD) is calculated for each lecturer, which is used for questions of staff development.

The peers acknowledge that ITS has established a comprehensive quality assurance system that is generally suitable to identify weaknesses and to improve the degree programmes. However, they also identify some weak points. In the meetings with students and lecturers, it becomes clear that all students have to fill out the course evaluation surveys in order to be able to access their grades through ITS's IT system. The peers are worried that this may lead to a lack of validity of the results as some students may not take enough time for the

survey and not fill it out with sufficient attention. Thus, they encourage ITS to reconsider this. A more serious issue appears to be that the students' feedback is not anonymous if it is directly linked to their student ID. To facilitate honest feedback and criticism, the university has to ensure that these surveys are absolutely anonymous.

Moreover, the peers learn that while the lecturers and the head of department receive the overall results of the course evaluation surveys, there seems to be no systematic way, in which the students are informed about these and about the measures that may be taken to improve the courses. In order to close the feedback loops, they consider such a process necessary and ask ITS to establish it, if it is indeed not yet in place.

As the peers understand it, the students as crucial stakeholders of the programmes are involved in the quality assurance processes in various ways, for instance through the surveys, but also through discussions with student representatives. The student representatives are, however, currently not directly involved in the decision-making processes. As the peers regard this as a good opportunity to strengthen the students' awareness and engagement, they suggest to consider whether there are ways how to achieve this.

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

As ITS did not give a statement regarding criterion 6, the peers retain their original assessment. They consider criterion 6 partly fulfilled. In order to achieve full compliance, the anonymity of the student course evaluation surveys has to be ensured and the results as well as the measures taken on their basis have to be systematically communicated to the students. Moreover, the peers recommend to involve the students more in the continuous improvement of the programmes and the institution, not only by providing information, but also by actively participating in the discussions and the decisions that are made.

D Additional Documents

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

1. Average study time for both Physics programmes
2. Module handbooks for “Additional activities” (38 SKS) in the Master’s degree programmes
3. Please explain the admission rules regarding applicants with colour-blindness. Please also clarify what ITS’s general policy towards the admission of students with disabilities is and what regulations exist on which level (national, ITS, department etc.). Besides colour-blindness, do other handicaps prevent students from being admitted into the programmes?
4. Are there any regulations for re-sits and compensation measures for exams for students with disabilities?

E Comment of the Higher Education Institution (11.11.2021)

The institution provided the following additional information and documents:

- Module handbooks for “Additional Activities”
- Compensation measures for students with disabilities
- Policy for students who cannot follow the evaluation due to illness, disability, or other reasons
- Dean’s letter regarding the policy of non-admission of people with colour-blindness

F Summary: Peer recommendations (15.11.2021)

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Physics	With requirements for one year	30.09.2027	--	--
Ba Chemistry	With requirements for one year	30.09.2027	--	--
Ma Physics	With requirements for one year	30.09.2027	--	--
Ma Chemistry	With requirements for one year	30.09.2027	--	--

Requirements

For all programmes

A 1. (ASIIN 3) It has to be ensured that the students receive their corrected exams and their results in case of distance exams.

A 2. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at ITS.

A 3. (ASIIN 5.1) Rewrite the module descriptions to incorporate all mandatory elements of the curricula and to include information about the responsible person, teaching methods, applicability, workload, examination requirements, and determination of the grade for each module.

A 4. (ASIIN 6) The students need to be informed about the results of the course evaluation surveys and about the measures that are taken to improve the courses.

A 5. (ASIIN 6) It has to be ensured that the course evaluation surveys are anonymous.

A 6. (ASIIN 1.4, 3) ITS has to admit students with colour-blindness into the programmes and establish a concept of how to accommodate their needs adequately in the courses. Compensation measures for exams have to be established accordingly.

Recommendations

For all programmes

E 1. (ASIIN 1.3) It is recommended to teach some general courses in English to improve the students' English communication skills.

E 2. (ASIIN 2.2) It is recommended to establish a system to monitor the actual student workload in the individual modules.

E 3. (ASIIN 2.3) It is recommended to develop a concept for hybrid teaching in the future.

E 4. (ASIIN 4.1) It is recommended to further strengthen the research of the departments.

E 5. (ASIIN 4.2) It is recommended to continue the efforts to strengthen the lecturers' English skills.

E 6. (ASIIN 4.3) It is recommended to extend the library opening hours to allow the students to study more flexibly.

E 7. (ASIIN 5.1) It is recommend to review the literature lists for the courses and update them where necessary.

E 8. (ASIIN 6) It is recommended to strengthen the students' involvement in the constant development of the programmes, for instance by involving student representatives in the relevant decision-making bodies.

G Comment of the Technical Committees

Technical Committee 09 – Chemistry, Pharmacy (23.11.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and concurs with the assessment of the peers.

The Technical Committee 09 – Chemistry, Pharmacy recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Chemistry	With requirements for one year	30.09.2027	--	--
Ma Chemistry	With requirements for one year	30.09.2027	--	--

Technical Committee 13 – Physics (24.11.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and concurs with the assessment of the peers.

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Physics	With requirements for one year	30.09.2027	--	--

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Physics	With requirements for one year	30.09.2027	--	--

H Decision of the Accreditation Commission (07.12.2021)

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

The Accreditation Commission discusses the procedure and generally agrees with the assessment of the peers and Technical Committees. The commission makes some editorial changes to the requirements, so that they are more precise. It also divides requirement A 6 into two distinct requirements to signify that there are two distinct issues, one regarding student admission, the other regarding exam compensation measures.

The Accreditation Commission decides to award the following seals:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation**
Ba Physics	With requirements for one year	30.09.2027	--	--
Ba Chemistry	With requirements for one year	30.09.2027	--	--
Ma Physics	With requirements for one year	30.09.2027	--	--
Ma Chemistry	With requirements for one year	30.09.2027	--	--

Requirements

For all programmes

A 1. (ASIIN 3) It has to be ensured that the students are granted access to their corrected exams and their results in case of distance exams.

A 2. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at ITS.

A 3. (ASIIN 5.1) Rewrite the module descriptions to incorporate all mandatory elements of the curricula and to include information about the responsible person, teaching methods, applicability, workload, examination requirements, and determination of the grade for each module.

A 4. (ASIIN 6) The students need to be informed about the results of the course evaluation surveys and about the measures that are taken to improve the courses.

A 5. (ASIIN 6) It has to be ensured that the course evaluation surveys are anonymous.

A 6. (ASIIN 1.4) ITS must not exclude students from admission on the grounds of colour-blindness and must establish a concept of how to accommodate their needs adequately in the courses.

A 7. (ASIIN 3) Establish official compensation measures for exams for students with disabilities.

Recommendations

For all programmes

E 1. (ASIIN 1.3) It is recommended to teach some general courses in English to improve the students' English communication skills.

E 2. (ASIIN 2.2) It is recommended to establish a system to monitor the actual student workload in the individual modules.

E 3. (ASIIN 2.3) It is recommended to develop a concept for hybrid teaching in the future.

E 4. (ASIIN 4.1) It is recommended to further strengthen the research of the departments.

E 5. (ASIIN 4.2) It is recommended to continue the efforts to strengthen the lecturers' English skills.

E 6. (ASIIN 4.3) It is recommended to extend the library opening hours to allow the students to study more flexibly.

E 7. (ASIIN 5.1) It is recommend to review the literature lists for the courses and update them where necessary.

E 8. (ASIIN 6) It is recommended to strengthen the students' involvement in the constant development of the programmes, for instance by involving student representatives in the relevant decision-making bodies.

I Fulfilment of Requirements (09.12.2022)

Analysis of the peers and the Technical Committee/s (01.12.2022)

Requirements

A 1. (ASIIN 3) It has to be ensured that the students are granted access to their corrected exams and their results in case of distance exams.

Initial Treatment	
Peers	fulfilled Justification: ITS has meanwhile found a solution by conducting online assessments through the MyITS Classroom platform, which is based on Moodle. It allows examiners to add annotations, which students can then see online. Although there is no formal regulation that examiners must use this platform and give detailed feedback, the evidence suggests that the system is actively used now.
TC 09	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 2. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at ITS.

Initial Treatment	
Peers	Most likely fulfilled Justification: General lab safety situation is strongly improved, maybe even too strict now: it seems questionable whether basket glasses are needed and preferable for the kind of work shown in the instrument lab where ergonomy really looks questionable now. For that reason, the use of face masks in the lab should be abandoned again as soon as pandemic control rules allow doing so.

	The fulfilment of this requirement can only be assessed by visiting ITS or through a detailed video tour.
TC 09	Not for all programmes fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	Not for all programmes fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel. However, the TC clarifies that this requirement did not initially apply to the Physics programmes.

A 3. (ASIIN 5.1) Rewrite the module descriptions to incorporate all mandatory elements of the curricula and to include information about the responsible person, teaching methods, applicability, workload, examination requirements, and determination of the grade for each module.

Initial Treatment	
Peers	fulfilled Justification: The module descriptions for all degree programmes have been revised and contain the prescribed information, such as the responsible person and workload.
TC 09	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 4. (ASIIN 6) The students need to be informed about the results of the course evaluation surveys and about the measures that are taken to improve the courses.

Initial Treatment	
Peers	fulfilled Justification: The original expectation was that lecturers would reliably discuss the results of course evaluations with the students in class, not that the results would be publicly available. However, the procedure that has already been introduced ensures that students are informed about the results, as stipulated in the requirement, and the fact that the information becomes public will likely ensure that it is acted on.
TC 09	fulfilled

	Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 5. (ASIIN 6) It has to be ensured that the course evaluation surveys are anonymous.

Initial Treatment	
Peers	fulfilled Justification: The course evaluation is now technically decoupled from the access to examination results in the classroom management platform and thus no longer linked to individual student IDs. Instead, ITS has implemented a system where feedback from all students is collected and pooled before being processed, so that it becomes anonymous. All lecturers have been instructed by the dean to follow this procedure
TC 09	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 6. (ASIIN 1.4) ITS must not exclude students from admission on the grounds of colour-blindness and must establish a concept of how to accommodate their needs adequately in the courses.

Initial Treatment	
Peers	not completely fulfilled Justification: The admission of students with special needs or disabilities in general and colour blindness in particular has been discussed and is addressed in a decree issued by the Vice Rector. However, this decree (or at least its translation) is not sufficiently specific. For example, it states that "ITS does not impose special requirements of colour blindness for certain study programs", which presumably means that applicants will not be rejected simply because of colour blindness. However, this applies only to certain study programs, and it is hence not clear whether it applies to the degree programs in chemistry and physics, which are the subject of this audit. Before a decision can be made, ITS must hence provide further information to clarify the future admission practice specifically in chemistry and physics. Ideally, they should also explain what measures are implemented to ensure that students with colour blindness can successfully complete modules

	where their disability was previously an obstacle. The Vice Rector's decree confirms that students with special needs may be granted extended study periods and support by special infrastructure facilities, but that alone may not be enough if assessment methods remain unchanged.
TC 09	not completely fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	not completely fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

A 7. (ASIIN 3) Establish official compensation measures for exams for students with disabilities.

Initial Treatment	
Peers	not fulfilled Justification: The reason for this requirement was the auditors' perception that compensation measures existed only for students whose illness or disability resulted from unforeseen circumstances after admission to the degree programmes, while students whose disability was known before their admission received no such treatment and would effectively be denied the chance to enter and complete the degree programmes on equal terms. Unfortunately, the submitted documents, especially the Vice Rector's decree, rather confirm this impression by reiterating the previous regulations. It is possible that ITS failed to understand the intended meaning of this requirement and could provide clarification if prompted, but the present response and the provided documents do not contain any evidence that ITS has acted on this issue.
TC 09	not completely fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	not completely fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.

Decision of the Accreditation Commission (09.12.2022)

The Accreditation Commission discusses the procedure and essentially follows the assessment of the peers and the expert committees. Regarding A6 and A7 the Accreditation Commission has received additional documents that dispel the doubts of the peers and therefore considers these requirements to be fulfilled. A 2, however, is not yet fulfilled. To meet this requirement, a detailed video presentation of the laboratories must be planned.

Having taken into consideration the assessment of the expert panel and the relevant Technical Committees, the Accreditation Commission took the following decision:

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Phyics	Requirement 2 not fulfilled		Prolongation for 6 months
Ma Physics	Requirement 2 not fulfilled		Prolongation for 6 months
Ba Chemistry	Requirement 2 not fulfilled		Prolongation for 6 months
Ma Chemistry	Requirement 2 not fulfilled		Prolongation for 6 months

J Fulfilment of Requirements (24.03.2023)

Analysis of the peers and the Technical Committee/s (15.03.2023)

A 2. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at ITS.

Secondary Treatment	
Peers	Fulfilled Vote: unanimous Justification: During the follow-up visit, the peers were able to verify that sufficient security measures are in place. In addition, ITS demonstrated that it had been able to modernize its facilities to a remarkable

	level in only one year. However, the peers emphasize that in addition to these significant changes, ITS must also consistently monitor the basics, such as labeling and security routes.
TC 09	fulfilled Vote: unanimous Justification: The Technical Committee briefly discusses the procedure and agrees with the assessment of the expert group.
TC 13	fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
AC	fulfilled/not for all programmes fulfilled/ not (completely) fulfilled Vote: unanimous / per majority Justification: […]
Initial Treatment	
Peers	Most likely fulfilled Justification: General lab safety situation is strongly improved, maybe even too strict now: it seems questionable whether basket glasses are needed and preferable for the kind of work shown in the instrument lab where ergonomy really looks questionable now. For that reason, the use of face masks in the lab should be abandoned again as soon as pandemic control rules allow doing so. The fulfilment of this requirement can only be assessed by visiting ITS or through a detailed video tour.
TC 09	Not for all programmes fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel.
TC 13	Not for all programmes fulfilled Vote: unanimous Justification: The TC agrees with the opinion of the peer panel. However, the TC clarifies that this requirement did not initially apply to the Physics programmes.
AC	Not for all programmes fulfilld Vote: unanimous Justification: The AC agrees with the opinion of the peer panel and the technical committees.

Decision of the Accreditation Commission (24.03.2023)

The Accreditation Commission discusses the procedure and follows the assessment of the peers and the expert committees.

Having taken into consideration the assessment of the expert panel and the relevant Technical Committees, the Accreditation Commission took the following decision:

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Phyics	All requirements fulfilled		30.09.2027
Ma Physics	All requirements fulfilled		30.09.2027
Ba Chemistry	All requirements fulfilled		30.09.2027
Ma Chemistry	All requirements fulfilled		30.09.2027

Appendix: Programme Learning Outcomes and Curricula

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

PLO	Description
PLO-1	able to apply logical, critical, systematic, and innovative thinking in the context of developing or implementing science and technology that takes into account the norms of religion, society, nation and state as well as scientific ethics in accordance with their field of expertise. [S]
PLO-2	able to demonstrate independent and responsible performance in the application of science and technology in the analysis of information and data compiled for problem solving in the field of physics expertise. [S]
PLO-3	able to perform management, leadership, and work together in a team in the capacity as a member or group leader and responsible for the achievement of teamwork. [KU]
PLO-4	able to communicate and apply information technology to document, store, and secure data. [KU]
PLO-5	able to develop themselves, long-life learning, and implement environmental insight and technology-based entrepreneurship. {KU}
PLO-6	Able to apply the theoretical concepts of classical physics and modern physics in depth through identification of the physical properties of a physical system. [P]
PLO-7	able to apply the principles and applications of mathematical physics, computational physics, and instrumentation in both how to operate physical instruments in general and analyse data and information from these instruments. [P]
PLO-8	able to apply the principles, characteristics, functions, and relevant and updated technological applications in the field of physics and software applications. [P]
PLO-9	able to formulate physical phenomena and problems and be able to make mathematical or physical modeling / simulations that fit the hypothesis based on the results of observations and experiments carried out. {KK}

PLO-10	able to comprehensively solve physical problems with various alternative solutions and analyse existing physical systems and predict the potential application of physical behaviour in information technology in the context of scientific development and further implementation in the field of physics expertise. {KK}
PLO-11	able to disseminate the results of problem (case) studies and physical behaviours based on standard scientific principles in oral and written communication in the form of reports or scientific works according to correct writing rules by understanding the plagiarism mechanism and publishing them at the national or international level. {KK}
PLO-12	able to adapt, collaborate, create, contribute and innovate in applying science in social life and has a global insight in his role as a citizen of the world, as well as being able to use the international language. {KK}

Note: KKNI Criteria: S = Attitude; KU = General Skills; P = Knowledge; KK = Specific Skills

The following **curriculum** is presented:

No.	Course Group	Semester	Credits SKS (ECTS)	Percentage (%)
	Generic Skill and Knowledge			**28.5**
1	**Basic Science**			**14.6**
	Physics 1	1	4 (6.4)	
	Mathematics 1	1	3 (4.8)	
	Chemistry 1	1	3 (4.8)	
	Biology	1	2 (3.2)	
	Physics 2	2	3 (4.8)	
	Chemistry 2	2	3 (4.8)	
	Mathematics 2	2	3 (4.8)	
2	**Character Building**			**7.6**
	Pancasila	1	2 (3.2)	
	Citizenship	2	2 (3.2)	
	Religion	2	2 (3.2)	
	Technological Insights and Applications	6	3 (4.8)	
	Technopreneurship	7	2 (3.2)	
3	**Supporting Tools**			**6.3**
	English	1	2 (3.2)	
	Bahasa Indonesia	2	2 (3.2)	
	Scientific Writing Methods (including Weekly Seminar on Monday)	7	2 (6.4)	

	Laboratory Management	8	2 (3.2)	
	Specialized Skills and Knowledge			**71.5**
1	**Main Knowledge in Physics**			**52.1**
	Mathematical Physics I	1	2 (3.2)	
	Physics III	2	3 (4.8)	
	Mechanics I	3	3 (4.8)	
	Waves	3	3 (4.8)	
	Thermodynamics	3	3 (4.8)	
	Mathematical Physics II	3	4 (6.4)	
	Electronics	3	4 (6.4)	
	Physical Measurement Methods	3	2 (3.2)	
	Mechanics II	4	3 (4.8)	
	Optics	4	3 (4.8)	
	Modern Physics	4	4 (6.4)	
	Mathematical Physics III	4	4 (6.4)	
	Instrumentation	4	4 (6.4)	
	Quantum Physics	5	4 (6.4)	
	Electromagnetic Field I	5	3 (4.8)	
	Laboratory Physics I	5	2 (3.2)	
	Computational Physics I	5	3 (4.8)	
	Statistical Physics	6	3 (4.8)	
	Electromagnetic Field II	6	3 (4.8)	
	Laboratory Physics II	6	2 (3.2)	
	Computational Physics II	6	3 (4.8)	
	Nuclear Physics	7	4 (6.4)	
	Solid State Physics	7	4 (6.4)	
2	**Expertise Fields**			**15.3**
	Material Science	4	2 (3.2)	
	Optoelectronics	5	2 (3.2)	
	Digital Data Acquisition	5	2 (3.2)	
	Geophysical Exploration Methods	6	2 (3.2)	
	Physics of Radiology and Dosimetry	7	2 (3.2)	
	Enrichment Courses	8	3 (4.8)	
	Elective Courses	7-8	12 (19.2)	
3	**Implementation**			**4.2**
	Final Project, including:	8	6 (9.6)	
	- TEFL		2 (3.2)	

- Student Extracurricular Credit Unit (SKEM)		2 (3.2)	

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

Learning Outcomes (LOs)

Attitude and Values	LO 1	Has good moral, ethics and personality in completing one's task
	LO 2	Capable of team work and has social sensitivity awareness of the public and the environment
Managerial Skills	LO 3	Able to collect data and information correctly, analyze and use analysis for correct decision making
	LO 4	Able to give alternative solutions with the characters of leadership, creativity and communication ability
	LO 5	Responsible for one's own work and is able to be give the responsibility of the achievement of an organization
Mastered Knowledge	LO 6	Able to master the concepts of structure, character and change of substance according to the aspects of dynamics and energetics
	LO 7	Able to master concepts, theory and methods on analysis and synthesis of chemical substances
Working Capacities	LO 8	Able to apply a chemistry mindset and utilize science and technology in their field and overcome problems that are faced.
	LO 9	Able to apply chemistry mindset in driving the creation of job opportunities

The following **curriculum** is presented:

LIST OF MANDATORY COURSES

No.	Course Code	List of Courses	Credit Ratings
1ST SEMESTER			
1	IG141106	Citizenship	3
2	IG14110x	Religious Studies	2
3	SB141303	General Biology	2
4	SF141203	Physics Fundamentals I	3
5	SK141301	Chemistry Fundamentals I	3
6	SK141302	Introdution to Statistical Methods	2
7	SM141203	Calculus I	3
		Total Credit Ratings	18
2ND SEMESTER			
1	IG141108	English Language	3
2	SF141204	Physics Fundamentals II	3
3	SK141304	Chemistry Fundamentals II	4
4	SK141305	Modern Physics	2
5	SK141341	Mathematical and Computational Chemistry	3
6	SM141204	Calculus II	3
		Total Credit Ratings	18
3RD SEMESTER			
1	IG141107	Technology and Scientific Communication Awareness	3
2	SK141306	Chemistry Literatures	2
3	SK141311	Methods of Measurements	4
4	SK141342	Molecule Structures	3
5	SK141343	Chemistry Thermodynamics	5
6	SK141351	Fundamental Organic Chemistry	3
		Total Credit Ratings	20
4TH SEMESTER			
1	SK141312	Separation and Purification Methods	4
2	SK141313	Spectometry	2
3	SK141321	The Structures and Reactivities of Anorganic Compounds	4
4	SK141344	Chemistry Dynamics	6
5	SK141352	The Reactions of Organic Compounds	4
		Total Credit Ratings	20
5TH SEMESTER			
1	SK141314	Chemometrics	2
2	SK141315	Chemistry Analysis Skills	2
3	SK141322	Anorganic Elements and Compounds	4
4	SK141331	Biochemistry	4
5	SK141345	Atom and Molecule Spectroscopies	3
6	SK141353	Organic Compounds Synthesis	4
		Total Credit Ratings	19
6TH SEMESTER			
1	IG141109	Technopreneurship	3
2	SK141307	Colloquia	2
3	SK141316	Electrochemistry and Thermal Analysis	2
4	SK141323	Synthesis and Characterisation of Anorganic Materials	5
5	SK141332	Bioprocess	4

6	SK141354	Identification of Organic Compounds	3
		Total Credit Ratings	19
7TH SEMESTER			
1	SK141308	Chemistry Study Case	2
2		Chosen Elective Course	16
		Total Credit Ratings	18
8TH SEMESTER			
1	SK141501	Final Assignment	8
2		Chosen Elective Course	4
		Total Credit Ratings	12

A. LIST OF RELIGIOUS STUDIES COURSES

No.	Course Codes	Names of Religious Studies Courses	Credit Ratings
1	SK141101	Islamic Religious Studies	2
2	SK141102	Protestant Christianity Religious Studies	2
3	SK141103	Catholic Christianity Religious Studies	2
4	SK141104	Hinduism Religious Studies	2
5	SK141105	Budhaism Religious Studies	2
6	SK141110	Khonghucu Religious Studies	2

B. LIST OF ELECTIVE COURSES

1. The Course Codes in accordance to the administering laboratoriums

No.	Course Codes	Name of Course Administering Laboratories
1	SK1441x	Chemistry Instrumentation and Analysis Methods
2	SK1442x	Material and Energy Chemistry
3	SK1444x	Material and Energy Chemistry
4	SK1443x	Microorganism Chemistry
5	SK1445x	Natural Resources and Synthesis Chemistry
6	SK1446x	Molecular Geochemistry
7	SK1440x	General Optional Subject (Non Laboratorium)

2. List of Elective Courses

No.	Course Codes	Name of Optional Courses	No. of Courses
1	SK141411	Environmental Chemistry	2
2	SK141412	Corrosion Analysis Methods	2
3	SK141413	Applied Analysis I	2
4	SK141414	Chemo-Biosensor	2
5	SK141415	Electroanalysis	2
6	SK141416	Applied Analysis II	2
7	SK141417	Forensic Chemistry	2
8	SK141418	Radiometry dan Their Applications	2
9	SK141421	Complex Compounds	2
10	SK141422	Organometallic Compounds	2
11	SK141423	Catalytic Chemistry	3
12	SK141424	Geochemistry and Mineralogy	2

13	SK141431	Genetics Engineering	2
14	SK141432	Food Ingredients Chemistry	2
15	SK141433	Bioremediation	2
16	SK141441	Colloid Chemistry	3
17	SK141442	Solid Substances Chemistry	2
18	SK141443	Surface Chemistry	3
19	SK141444	Industrial Chemistry	2
20	SK141445	Polymers	2
21	SK141446	Membrane Chemistry	2
22	SK141451	Phychemistry	3
23	SK141452	The Systematics of Plant Chemistry	2
24	SK141453	Deodorant and Flavour Chemistry	2
25	SK141454	Medicine Chemistry	2
26	SK141455	Organic Stereochemistry	2
27	SK141456	Introduction to Organic Geochemistry	3
28	SK141457	Coal Geochemistry	2
29	SK141458	Biomarkers Analysis	2
30	SK141401	Laboratorium Management	2
31	SK141402	Work Experience	2
32	SK141403	Marine Chemistry	2
33	SK141404	Capita Selecta	2
		Total Credit Ratings	71

According to the website the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Physics:

1. Developing a positive and responsible attitude individually and collectively in law enforcement, ethics, community life and environmental sustainability.
2. Developing logical, critical, systematic, and creative thinking through scientific research in science and technology according to the field of physics competence.
3. Identifying the scientific field of physics as the research topics following the robust road map developed within inter- or multi-disciplinary science and technology.
4. Mastering advanced physical concepts and their application to solving theoretical and experimental research problems based on the principles of the scientific method by analysing and processing data obtained in laboratories and nature.
5. Identifying and implementing various special topics in physics using the analytical and computational approach or obtaining and processing the data through specific hardware and software.
6. Implementing and updating sustainable physical knowledge by doing the appropriate research in many fields.
7. Documenting, saving, arranging and presenting the research data based on scientific principle and ethics in the form of master thesis.

8. Compiling and communicating the ideas and scientific argument to academic society or even public.

The following **curriculum** is presented:

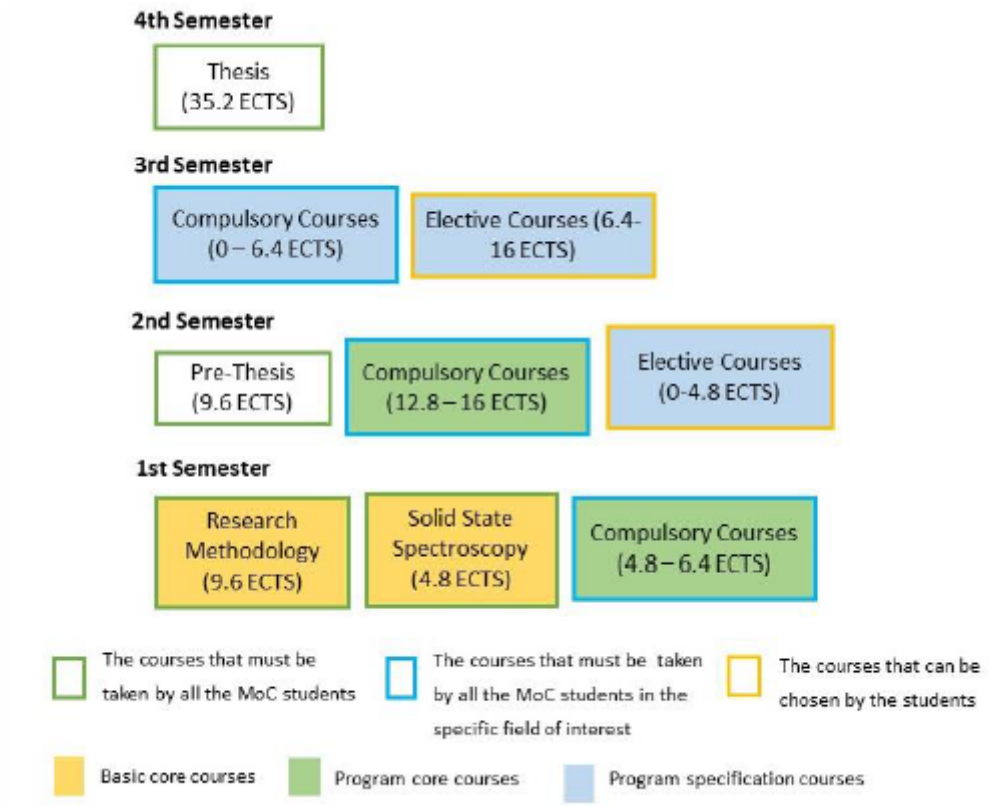
No.	Kode MK Course Code	Nama Mata Kuliah (MK) Course Name	SKS Credit
		SEMESTER I	
1	SF185101	Mekanika Klasik Classical Mechanics	3
2	SF185102	Elektrodinamika Electrodynamics	3
3	SF185103	Metode Riset Fisika Research Methods in Physics	2
		Jumlah sks **Total credits**	**8**
		SEMESTER II	
1	SF185201	Mekanika Statistik Statistical Mechanics	3
2	SF185202	Mekanika Kuantum Quantum Mechanics	3
3	SF1852XX	Mata Kuliah Pilihan Elective Course	3
		Jumlah sks **SKS Total**	**9**
		SEMESTER III	
1	SF185301	Pra Tesis Pra-Thesis	2
2	SF1853XX	Mata Kuliah Pilihan Elective Course	8
		Jumlah sks **SKS Total**	**10**
		SEMESTER IV	
1	SF185401	Tesis Thesis	6
2	SF1854XX	Mata Kuliah Pilihan Elective Course	3
		Jumlah sks **SKS Total**	**9**

According to the website the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Chemistry:

Educational Learning Outcomes

Attitudes Values	LO 1	Show moral, ethical, responsibility and good personality in completing their duties
	LO 2	Show a spirit of independence and team work in completing their duties.
	LO 3	Able to solve complex problem and analyze them to be developed using logical thinking based on scientific principles.
Manega-rial Skill	LO 4	Able to develop leadership attitudes, creativity and communication skills in solving a chemistry-related problem .
	LO 5	Able to show responsibility of their individual and team work
Mastered Know-ledge	LO 6	Able to analyze and synthesis the concept of structure, properties and substance changes at the micro- or marcomolecular level based on the dynamic and energetic phenomenon.
	LO 7	Able to analyze and synthesis the concept, theories and methods on the analysis and synthesis of chemical substances by consider the right instrument and the substance side effect in order to develop the chemistry
Working	LO 8	Able to identify, formulize and solved the science and technology problems related to structure and chemical change through the accurate and innovative theoretical, -experimental or -computational approach
Capacities	LO9	Able to build a chemical knowledge especially in the energy, environmental, marine and medical in order to develop the research, industry and employment creation

The following **curriculum** is presented:


4th Semester
Thesis (35.2 ECTS)
3rd Semester
Compulsory Courses (0 – 6.4 ECTS)
Elective Courses (6.4-16 ECTS)
2nd Semester
Pre-Thesis (9.6 ECTS)
Compulsory Courses (12.8 – 16 ECTS)
Elective Courses (0-4.8 ECTS)
1st Semester
Research Methodology (9.6 ECTS)
Solid State Spectroscopy (4.8 ECTS)
Compulsory Courses (4.8 – 6.4 ECTS)
The courses that must be taken by all the MoC students
The courses that must be taken by all the MoC students in the specific field of interest
The courses that can be chosen by the students
Basic core courses
Program core courses
Program specification courses