



# **ASIIN Seal & EUR-ACE<sup>®</sup> Label**

## **Accreditation Report**

**Bachelor's Degree Programme**  
***Geophysical Engineering***

Provided by  
**Institute of Teknologi Bandung**

Version: 08.12.2017

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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 <sup>1</sup>	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) <sup>2</sup>
Program Studi Sarjana Teknik Geofisika	Bachelor of Geophysical Engineering	ASIIN, EUR-ACE® Label		FA 11
<p><b>Date of the contract:</b> 15.12.2014</p> <p><b>Submission of the final version of the self-assessment report:</b> February 2016</p> <p><b>Date of the onsite visit:</b> 18.-19. July 2016</p> <p><b>at:</b> Bandung</p>				
<p><b>Peer panel:</b></p> <p>Prof. Dr. Rafiq Azzam, RWTH Aachen (Technical University of Aachen);            Prof. Dr. Detlef Doherr, University of Applied Sciences of Offenburg;            Prof. Dr. Andreas Hoppe, Technical University of Darmstadt;            Dr. Hans-Jürgen Weyer; BDG (Professional Association of German Geoscientists)</p> <p>The student peer Faruk Afero had to cancel his participation due to sickness</p>				
<p><b>Representative of the ASIIN headquarter:</b> Dr. Michael Meyer</p>				
<p><b>Responsible decision-making committee:</b> Accreditation Commission for Degree Programmes</p>				
<p><b>Criteria used:</b></p> <p>European Standards and Guidelines as of 15.05.2015</p>				

<sup>1</sup> ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes

<sup>2</sup> TC: Technical Committee for the following subject areas: TC 01 – Mechanical Engineering/Process Engineering; TC 02 – Electrical Engineering/Information Technology); TC 03 – Civil Engineering, Surveying and Architecture; TC 04 – Informatics/Computer Science); TC 05 – Physical Technologies, Materials and Processes); TC 06 – Industrial Engineering; TC 07 – Business Informatics/Information Systems; TC 08 – Agronomy, Nutritional Sciences and Landscape Architecture; TC 09 – Chemistry; TC 10 – Life Sciences; TC 11 – Geosciences; TC 12 – Mathematics; TC 13 – Physics.

**A About the Accreditation Process**

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ASIIN General Criteria as of 28.03.2014	
Subject-Specific Criteria of Technical Committee 11 – Geosciences as of 09.12.2011	

## B Characteristics of the Degree Programme

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF <sup>3</sup>	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Geophysical Engineering	B.Sc.		Level 6	Full time	--	8 Semester	200 ECTS/ 144 CU	February 1998; Winterssemester

For the Bachelor's degree programme the institution has presented the following profile in the study guide for students.

1. Having an understanding for knowledge and methodology in a broad spectrum of geophysical engineering, including resource exploration, environmental geophysics, seismology, and tectonics, as well as having a problem solving capability in their work.
2. Having a capability to acquire, process, and interpret the geophysical data for a broad spectrum of geophysical engineering, including resource exploration, environmental geophysics, seismology, and tectonics; and rise upon that foundation with advanced course work in geophysics to develop the in-depth knowledge which students need to pursue advanced-graduate study and professional career in government or private sector.
3. Keeping with development on students' geophysical fields of interest and their interactions with science and technology, industry, and life in general.
4. Having a capability to communicate ideas, either orally and in writing, either scientifically or popularly, to take appropriate initiatives, and to lead a working group in relevant fields.
5. Having a capability to continuously develop knowledge for further study, either formally or informally.

On those bases, UPGE sets the Programme Learning Outcomes (PLO) for the graduates as follows:

6. They understand the basic knowledge such as mathematics, physics and chemistry which form the basis for geophysical observation and measurement.

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<sup>3</sup> EQF = The European Qualifications Framework for lifelong learning

7. They understand basic geological knowledge such as physical geology, earth structure and composition, earth tectonics, and earth evolution process.
8. They are able to identify the physical processes governing the behavior of common geophysical systems in the natural system.
9. They are able to quantitatively describe the behavior of natural systems and the principles of geophysical data acquisition, processing, and interpretation with physics-based mathematical models.
10. They are able to explain and apply the principles of geophysical methods for natural resource explorations, natural hazards, engineering and environmental matters.
11. They are able to investigate the mathematical models by solving the governing equations with combination of analytical and computational methods in order to achieve better sub-surface interpretation.
12. They are able to effectively communicate their scientific knowledge through written and oral presentations, able to interpret and evaluate the published literature and oral and poster presentations at scientific seminar.
13. They are able to demonstrate a good teamwork, leadership, positive attitude, responsibility, work ethics, entrepreneurship skill, and other personal qualities & interpersonal capabilities.

## C Peer Report for the ASIIN Seal<sup>4</sup>

### 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 guide
- Discussions with representatives of the university

**Preliminary assessment and analysis of the peers:**

The Institut Teknologi Bandung (ITB) defined study aims and intended learning outcomes of the Bachelor Programme at a level of higher education which corresponds to learning outcomes relevant to level 6 of the European Qualifications Framework. Learning outcomes are described in the study guide which is accessible on the ITB web site to students, staff members, and all the other stakeholders. Those objectives were discussed in academic staff meetings with the faculty team, alumni, professional societies, industry, and government/public agencies.

The peers found the areas of competence as set forth by the Subject-Specific Criteria in Geosciences to be largely met by the programmes. Regarding the underlying bases the students shall have basic knowledge and understanding of the natural sciences, of the essential features, processes, materials, history and the development of the Earth and of the of the key aspects and concepts of geology. They shall be aware of the temporal and spatial dimensions in Earth processes and of the applications and responsibilities of Geosciences and its role in society including its environmental aspects. Furthermore the peers found adequate intended learning outcomes regarding to engineering abilities in analysis, design and implementation, technological, methodological and transferable skills and

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

additional professional competences to confirm the engineering aspect in the title of the programme.

The intended profile of the programme offers students good chances at the labor market as researchers, lecturers, teachers, industrial experts as well as entrepreneurs in the oil and mining industry as well as in research institution or governmental organizations bearing in mind the actual economic problems in the oil and gas area.

### Criterion 1.2 Name of the degree programme

**Evidence:**

- The name of the study programme is published in the specific regulation, the study guide and on the webpage.

**Preliminary assessment and analysis of the peers:**

The title of the programme is published on the subject specific webpage. The auditors confirmed that the names of the degree programme properly reflected the intended aims and learning outcomes also regarding to the engineering aspects. The information about the programme is published in English and in Indonesian language. The study programme is primarily carried out in Indonesian language.

### Criterion 1.3 Curriculum

**Evidence:**

- The study regulations define the curriculum and the single modules.
- The module descriptions inform about the aims and content of the single modules.
- Objective-Matrices provided in the Self-Assessment Report, Appendix 5
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

**Preliminary assessment and analysis of the peers:**

During the first year which is common for all students of the faculty the fundamentals in mathematics and natural sciences are treated as well as fundamentals of engineering and design. Additional students get knowledge about information technology and were introduced how to write scientific papers. The second year contains specific fundamentals of geophysics such as tectonophysics, sedimentology, crystallography and mineralogy, physical geology, wave theory and electronics and computing in geophysics. Additional students get special knowledge of geomathematics and a general introduction into geophysics and computing in geophysics. In the third year students get familiar with specific



methods in geophysics and engineering and more deepened fundamentals like thermo- and fluid- and geodynamics, geoelectricity and electromagnetism, gravity and seismology, petroleum geology as well as geostatistic, geophysical signal and analysis, or the reflection of seismic data. Additional there is a field camp of two weeks included in the third year. During the fourth year the final project stands in the focus imbedded in modules about earth crust mechanics, volcanology and geothermal exploration, interpretation of seismic reflections, engineering and environmental geophysics and a communication module. Students can select an individual specialization by choosing eight elective courses from the second to the fourth year. Therefore students get advices from professors which courses should be chosen to get a special specialization.

In general, the panel acknowledged that the curriculum is very much aligned to the expected learning outcomes. The overall objectives and intended learning outcomes for the degree programme are systematically substantiated and updated in its individual modules. It is clear which knowledge, skills and competences students will acquire in each module.

But they got the impression that some of the fundamentals of geology like structural geology, geological mapping, geotectonics, regional geology or geochemistry are not compulsory but only elective. Peers and programme coordinators agreed that certain geological fundamentals are necessary for geophysics as well. So the peers welcomed that the advisors of the students ensure that the main basics in geology are selected. But from their sight of view additionally it would be very helpful to define additionally elective rules which ensure that all students get at least basic knowledge in geological core disciplines.

The peers determined that GIS is handled in several modules concerning to the application in those modules and that data bases are included in geostatistical aspects.

The peers found a field camp of only two weeks relatively short for students to get adequate experiences in practical field work. Although there are included some more excursions in several modules the peers do not have the impression that students make different experiences about the heterogeneous geology of Indonesia. Therefore they recommended to increase the opportunities for students to get more practical experiences in field work also taking account the desire of the students for more applied individual projects.

Furthermore the peers could follow the wish of the students for more opportunities to train their communications skills. Besides the module about communication in geophysics which deals with field specific communication there are included some little presentations only in a few modules. The peers recommended that the students should get more opportunities to train their professional skills in general which includes on the one side

team working abilities and communication skills. Additionally students should train more intensively their professional English language skills and should get at least some basic economic knowledge. In this context the peers are sorry that the internship at companies is not a mandatory part of the curriculum because from their side of view it would be a good opportunity for students to train their professional skills as well.

The peers welcomed that there are religious modules not only for the Islam religion as mentioned in the module handbook but for all other Indonesian religions as well and that students are free to choose one of those modules even if they have not this religion by themselves. They marked that the descriptions of the other religious modules are missing yet in English language. The students confirm that those descriptions are reachable for them in national language. Nevertheless the peers asked for all module descriptions in English language, also the description of the field camp, especially with regard to foreign students.

Besides these remarks in detail the peers assessed the curriculum as well structured to attain the defined study objectives. In their assessment they were confirmed by representatives of the industry who saw the graduates of ITB well prepared for the labor market.

#### **Criterion 1.4 Admission requirements**

##### **Evidence:**

- Joint Self-Assessment Report,
- Regulation of Ministry of Education (of Indonesia) No. 034/2010
- Student Admission: Rector Decree No. 169/SK/I1.A/PP/2012 on Academic and Student Regulations Institut Teknologi Bandung

##### **Preliminary assessment and analysis of the peers:**

The peers were explained that admission to the undergraduate programmes of ITB was conducted centrally by the ITB and the national committee on student selection for university studies. The management of student admission is centrally-organized at the Directorate of Education of ITB for all faculties and schools within ITB. Since 2011, ITB had been using the national-level student admission system. The national admission committee is composed from all state university delegates.

60% of the students got their admission regarding to their school grades the other 40% by later additional examinations. In case of more applications than available study places there is a ranking of the grades. The students apply for faculty not for single programme and take their choice after the first common year. The purpose of this "First Common

Year Programme” is to ensure that all students have the same knowledge and scientific foundation before entering the actual degree programmes. At the end of this first year, each student proposes three choices of study programmes they want to enter. Based on the performance of the students in the first year, the best students are admitted to the first choice. If all places in a degree programme are occupied, students are distributed into the programmes of the second choice and so on.

In addition, through the Law of the Republic of Indonesia the government mandates all state universities to recruit students who have a high academic-performance but not the financial resources to pay the tuition fees. At least 20% of the new students admitted to the university have a background that does not allow them to pay the tuition fees. The government covers the financial expenses and provides incentives to the university to implement this policy.

The auditors confirmed that the requirements and procedures for admission are transparent and clear. All applicants are treated according to the same standards and regulations. According to the peers, especially the faculty-specific test supported the students in achieving the learning outcomes. Furthermore, the auditors appreciated the “First Common Year Programme” as it ascertains that all students meet adequate standards when entering the degree programme.

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

Because the university abstained from a comment on this criterion the peers confirmed their previous assessment. They see the criterion fulfilled in general but recommended to ensure that all students get at least basic knowledge in geological core disciplines. Additionally the peers recommended to increase the opportunities for students to get more practical experiences in field work and to offer more opportunities for the students to improve their professional skills (communication skills in general, professional English language skills, economic knowledge).

## **2. The degree programme: structures, methods and implementation**

<b>Criterion 2.1 Structure and modules</b>
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**Evidence:**

- Rector Decree on Academic and Student Regulations Institut Teknologi Bandung
- Guidelines for Credit Earning and Credit Transfer at Institut Teknologi Bandung
- Module handbook

**Preliminary assessment and analysis of the peers:**

The programme structure of Undergraduate Programme within Institut Teknologi Bandung (ITB) is described in the “Regulation of Academic and Student Affairs”. All degree programmes are divided into modules which are accredited with credit points and comprise a sum of teaching and learning.

The programme structure under review is clearly outlined on the subject specific website for each study programme. The programme consists of modules which comprise a sum of teaching and learning. The module descriptions are also published on the subject specific website in English and can be downloaded. Based on the analysis of the sequence of modules and the respective module descriptions the peers concluded that the structure of the degree programme ensures that the learning outcomes can be reached. The programme also offers a number of elective courses which allows the students to define an individual focus. Based on the analysis of the curriculum and the module descriptions the peers confirmed that module objectives and the respective content help to reach both the qualification level and the overall intended learning outcomes.

The auditors understood that the “Common First Year Programme” intended to strengthen the comprehension of basic sciences and enhancing required learning aptitudes. The Bachelor stage managed by the programmes within each faculty or school intended to develop the knowledge and skill of the chosen discipline.

When looking at international exchange programmes ITB explained that the university maintains a number of exchange programmes with many universities; ITB also runs a number of dual degree programmes. As outlined in the Self-Assessment Report the peers could study the list of university co-operations. The programme coordinators added that there are also particular programmes on the level of faculties.

However, only Master students benefited from these programmes and hardly any undergraduate students could participate in any of these programmes due to the fact that there is hardly any scholarship support for covering living expenses. Even though there is a large interest among undergraduate students there are only very scarce opportunities. The peers understood that ITB was highly dependent on governmental funding because ITB is a state university; that is why ITB should also look for alternative funding sources (e.g. from alumni and industries) to send their students abroad. Hence, the peers recom-

mended improving the (financial) opportunities for students (including alternative funding sources) to complete a period of vocational practice or a stay at a different higher education institution abroad without any prolongation of the studies.

Regarding the recognition of credit points, ITB explained that there exist a number of agreements with specific universities and students could arrange learning agreements with the supervisor to make sure credit points are easily recognized. But even if learning agreements have not been drafted beforehand, students can get credit points accredited if the modules were also part of the curriculum of ITB. This needs to be approved by the supervisor. The peers understood that student mobility was practically taking place and the “Guidelines for Credit Earning and Credit Transfer at Institut Teknologi Bandung” provided a clear regulation of recognition of credit points.

In general, the undergraduate programmes at ITB were designed to be completed within four academic years. The maximum length of study is limited to six years. The peers were explained that the majority of students completed their degree in the given 4 year’s time frame and only a minority needed to extend the studies to 6 years. According to ITB this applied to all study programmes. The figures provided in the Self-Assessment Report also proved that only a very small number of students resigned or dropped out. The peers could comprehend that the curriculum was structured in a way to allow students to complete the degree in the regular timeframe.

## **Criterion 2.2 Work load and credits**

### **Evidence:**

- Self Assessment Report of the Faculty of Mechanical and Aerospace Engineering, chapter 3.2 and APPENDIX 8 WORKLOAD CALCULATION
- Module descriptions:
- Study Load per Semester: Rector Decree No. 169/SK/I1.A/PP/2012 on Academic and Student Regulations Institut Teknologi Bandung
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

### **Preliminary assessment and analysis of the peers:**

The programme coordinators explained that ITB uses credit units instead of credit points and 1 credit unit (SKS) is equivalent to 60 hours of workload. Students have to earn 144 credit units in order to earn their bachelor’s degree. The normal length of study to achieve the bachelor’s degree is 4 years, or 8 semesters. On average, each student takes

20 credit units per semester and in § 1, Article 1.6 of the “Academic and Student Regulations” it is defined that 1 credit unit for the undergraduate programme is equivalent to 3 hours a week: 1 hour of contact time with teaching staff, 1 hour of structured activities related to lectures, and 1 hour of independent study but this ratio can change according to the activities in a module. For example, for laboratory activities, final projects, and internships, 1 credit unit is equivalent to 3-5 hours a week of independent student study. This is also properly reflected in the module descriptions. The peers understood that the work load comprises both attendance-based learning and self-study which includes all compulsory elements of the degree. The modules descriptions are published on the website and can be accessed by interested stakeholders. The peers positively noted that the module handbook describes consistently in all modules the credit points and the workload distinguishing between contact time and time of self-study

Comparing to the objectives and the content the workload defined for the single modules seems to be realistic for the peers and they saw that structure-related peaks in the workload have been avoided. This impression was confirmed by the students.

<b>Criterion 2.3 Teaching methodology</b>
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**Evidence:**

- Self Assessment Report
- Module descriptions:
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

**Preliminary assessment and analysis of the peers:**

The Undergraduate Programmes at ITB are full-time programme with classroom, structured, and self-study activities. The staff members of ITB apply various teaching and learning methods (such as lectures, computer training and classroom and lab exercises, individual and group assignments, seminars and projects). Structured activities include tutorial, homework, assignment (reading or problem exercises), and practical activities. Group project assignments are also given in some courses to develop students’ skill in teamwork, discussion, and coordination. The peers concluded also with reference to the remarks of the students that the teaching methods and instruments used supported the students in achieving the learning outcomes.

The peers recognised that students learn independent academic research and writing during the “Common First Year” where are several compulsory modules for all students

like “Scientific Writing in Indonesian”, “Introduction to Information Technology”, and “Academic Writing (English)”. Furthermore, in the 8<sup>th</sup> semester, the curriculum includes a final project, which is a written report related to a topic in the student’s major studies. The project is conducted independently under guidance of a supervisor and consists of literature study, empirical research (including experimentation/observation), or simulation. This Final Project report is then defended orally in front of examiners. The peers confirmed that independent academic research and writing are properly implemented in the curriculum.

#### **Criterion 2.4 Support and assistance**

##### **Evidence:**

- Self Assessment Report of the Faculty of Mechanical and Aerospace Engineering, chapter 3.4
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

##### **Preliminary assessment and analysis of the peers:**

The peers welcomed the concept of an academic advisor. The programme coordinators explain that as students commence their studies in the Common First Year programme, an academic advisor is appointed for each of them. One academic advisor is responsible for supervising about 20 students. Usually, the academic advisor is available for any consultation a student may need, even for problems beyond academic matters. Academic data of the students are monitored and recorded at the university level through the academic information system. At the beginning of each semester, based on the student’s prior performance, the academic advisor gives considerations concerning the courses a student should take. The students confirm that the academic advisors normally try to be very supportive to students and if a student’s performance is becoming worse or the work ethics of a student is not as it should be, the academic advisors contact the parents or friends to take influence in the respective student.

The peers noticed that an “Undergraduate Handbook” was published on the website which contained a lot of information on additional support services like the “Counselling Center” where students can get consultation about academic or non-academic problems. Depending on the kind of problem, also psychological services were offered. If students felt under severe pressure they could also turn to the Dean. The Agency for Students managed all types of scholarships and provided respective support for students who were eligible. ITB’s health centre offered health services for students and faculty members. The

ITB Career Development Centre (ITB CDC) maintained an on-line job application and career opportunity information system for all ITB students. ITB also maintained a Language Centre which offers courses for ITB students and staff particularly pre-departure courses like “TOEFL Preparation Courses” and “Courses in English for Specific Purposes” especially in science and technology. The auditors concluded that there were adequate resources available to provide individual assistance, advice and support for all students. The peers underlined that the allocated advice and guidance, namely the academic advisor assisted the students in achieving the learning outcomes and in completing the course within the scheduled time.

Besides this very comprehensive advisory system the peers noticed some difficulties regarding the mobility of students. In case students want to go abroad they reported about financial problems to realise a study abroad. The normal tuition fee for ITB students, which enrolled in the academic year of 2014/2015, is IDR 10,000,000 or equal to US\$ 760 for one semester. This fee can be lowered to up to 25% (IDR 2,500,000). This reduction is based upon student's parents earnings (US\$ 1 =IDR 13,000). Grants for the normal fees are available for 20% of the students. But there seems to be no grants or other financial supports for a study abroad. Additionally the students reported that the institutional advisory system for international affairs does not work very well and that they are dependent on the personal support of single professors. The peers recommended to improve the (financial) opportunities for students to complete a period of vocational practice or a stay at a different higher education institution abroad.

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

Because the university abstained from a comment on this criterion the peers confirmed their previous assessment. They see the criterion fulfilled in general but recommended to improve the (financial) support for students to absolve vocational practice or studies abroad and to improve the advisory system according to international affairs.

### **3. Exams: System, concept and organisation**

<b>Criterion 3 Exams: System, concept and organisation</b>
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**Evidence:**

- Self Assessment Report
- Module descriptions:



- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

**Preliminary assessment and analysis of the peers:**

Within the examination regulations rules have been defined for resits, disability compensation measures, illness and other mitigating circumstances. Failed exams can be repeated in the next year thereby students get the opportunity to repeat the lecture as well. Failed exams can be repeated as often as students like to do but the complete study time is limited to six years.

The peers were explained that ITB adopted the concept of multi-component assessments to measure the achievement of course outcomes and thus the programme's learning outcomes. The types of examinations used in each course were determined in the syllabus and the module descriptions of the curriculum. In the module descriptions it was specified that in most modules the overall final grade was composed of the mid-term test, the final examination, quizzes and home work. In principal, the auditors supported this approach of a "continuous assessment" as it offered students continuous feedback on their progress in developing competences. The peers marked that there are no complete information in the module descriptions about the form of exams and their duration. This have to be added to the descriptions.

The programme coordinators explained that the ITB Directorate of Education arranges the schedule of examinations. The mid-semester examination is usually held in week 8 or 9, while the end-semester examination takes place during the 2 weeks following completion of the classes. In addition to the publication of the course schedule, the examination dates and times are announced on each undergraduate programme's announcement board. The students confirmed that the examinations were well organised and fully transparent. The peers gained the conviction that exams were marked using transparent criteria. The auditors understood that the deadline for submission of the Final Score List is two weeks after the end of semester examinations to ascertain that no delays hampered the progression of the students. Students have the right to inquire their marked examination, quizzes, and assignments and can ask questions should there be a grading mistake. The lecturers have the obligation to arrange examinations for students who have not taken the examination for a valid reason; for students with disabilities or other limitations compensational measures are agreed on individually.

The students have to finish a final project by conducting research in one of the areas of interest. Each student chooses a prospective supervisor and decides on the research subject for their final project. The objective of the final project is to synthesize the eophysical engineering knowledge, apply the scientific method to conduct problem solving and ob-

tain the research objective, and deepen the understanding in the research areas concerned. The final project takes 6-12 months to complete, depending on the complexity of the research. The final project report is defended orally in front of a committee. The auditors examined the final theses and gained the impression that the quality of the theses was generally of good standard.

The peers also welcomed the fact that students carried out the final thesis outside the university. Some lecturers maintained close connections to private businesses and if the supervisor and the student agreed on a topic accepted by the private company the project could be conducted in the company.

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

Because the university abstained from a comment on this criterion the peers confirmed their previous assessment. They see the criterion completely fulfilled.

## 4. Resources

<b>Criterion 4.1 Staff</b>
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**Evidence:**

- Self Assessment Report of the Faculty of Mechanical and Aerospace Engineering, chapter 3.4
- Staff handbook for all degree programmes under review (Self Assessment Report, Appendix 4)
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

**Preliminary assessment and analysis of the peers:**

In general the peers noticed that the composition, scientific orientation and qualification of the teaching staff team are suitable for sustaining the degree.

There were 27 lecturers involved in the programme with 90% of them having a Doctoral Degree from universities abroad (i.e. Germany, France, Netherlands, Japan, Australia, Canada or other Indonesian universities). Seven lecturers had the status of full professors. The academic lecturers have average of 20 years experience in teaching or professional experiences. The additional supporting staff includes 94 people over the complete faculty. The ratio between lecturers and students is 1:15.

The peers were impressed by the quantity of the staff. But they determined at the same time that there were included only technicians for the field of geophysics. From their side of view this technical support for the professors seems to be very small regarding to laboratory practice of the students and research activities of the professors. Also with regard to the vision of ITB to develop the faculty to an institution with international quality standards they recommended to increase the technical staff in order to ensure the use of the well equipped laboratories in teaching and research.

The staff acted in several research projects with industry especially in the field of geothermal energy.

#### **Criterion 4.2 Staff development**

**Evidence:**

- Self Assessment Report
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

**Preliminary assessment and analysis of the peers:**

ITB explained that there were several concepts to enhance the didactical competences of staff members. ITB supported academic staff members who hold a master's Degree to continue their study to doctorate level. Faculty members were encouraged to present their research papers in both national and international conferences, and to collaborate with colleagues from leading foreign universities. Additionally, there is a specific division at ITB offering in-house training particularly in relation to human resources development, management and organization. Especially new staff members were required to take short courses in teaching methodology. Hence, the peers could see that ITB offered opportunities to staff members to further develop their professional and teaching skills. Sabbaticals are possible for the lecturers with a funding from government for 3 month and there were financial support for visiting congresses as well.

#### **Criterion 4.3 Funds and equipment**

**Evidence:**

- Self Assessment Report
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

**Preliminary assessment and analysis of the peers:**

The peers were explained that financial sources for ITB originated from government funding, society funding, and tuition fees. The report provided an overview of the “operational budget” and the “research grants” for the Faculty. The operational funds were distributed to the Faculties and Schools of ITB based on a specific formula depending on the number of students. The school of geophysics got 2700 Euro per bachelor student. The salary for staff members included a basic salary from government and incentives depending on additional efforts of staff members. The management of ITB stressed that even if the contributions from private businesses decreased to zero due to bad economic developments, ITB would still be capable to maintain its operations.

The peers took were convinced that the financial means were sufficient and secured for the timeframe of the accreditation.

The financing of the equipment is ensured mostly by external funds (third party money). Because the actual standard is only increasing slowly the peers noticed room for modernisation of the software equipment. Especially they saw only limited opportunities for GIS supported interpretations of geophysical data. The peers saw very well equipped laboratories but the doubt whether this good standard could be ensured for the future with the available financial amount. Therefore they recommend to modernize the software equipment and to ensure the financial basic for the continuous modernization of the laboratory equipment. Additional they noticed a room shortage in general and especially an improvement of the workplaces for the individual work of students would be very helpful.

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

Because the university abstained from a comment on this criterion the peers confirmed their previous assessment. They see the criterion fulfilled in general but recommended to increase the technical staff in order to ensure the use of laboratories in teaching and research. Additional they recommended to modernize the software equipment to allow GIS supported interpretations, to ensure the financial basic for the continuous modernization of the equipment and to offer more workplaces for the individual work of the students.

## 5. Transparency and documentation

<b>Criterion 5.1 Module descriptions</b>
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**Evidence:**

- Module descriptions:

**Preliminary assessment and analysis of the peers:**

The peers positively noted that the full set of modules descriptions is published for every degree programme under review. Hence, the module descriptions are available for all interested stakeholders. The peers examined the module descriptions of all three programmes and noted that the modules have comprehensible names and identification codes, however they noticed that the descriptions of the non Islamic religion modules and the internship are missing. Additionally not in all cases the content and didactical methods were completely described and not all conditions for the award of credits (form and duration of the exams) were given. Here the peers saw the need of a revision of the module descriptions.

<b>Criterion 5.2 Diploma and Diploma Supplement</b>
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**Evidence:**

- Certificate of study programme is missing
- Transcript of Records of study programme is missing
- Diploma Supplement is missing

**Preliminary assessment and analysis of the peers:**

The peers comprehended that after graduation a degree certificate, a transcript of records and a Diploma Supplement are issued. However, none of these documents had been made available to the peers and they request to submit this as additional information. Statistical data as set forth in the ECTS User's Guide are not included to allow readers to categorise the individual result/degree.

<b>Criterion 5.3 Relevant rules</b>
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**Evidence:**

- Regulations for Academic and Student Affairs Institut Teknologi Bandung

**Preliminary assessment and analysis of the peers:**

The peers acknowledged that in the “Academic and Student Regulations” a full section on “Student Ethics” clearly defined the behavioural expectations ITB had towards the students. Furthermore, the section on “Academic Regulations” explained the rights and duties of ITB and students in detail. The auditors could see that all necessary rights and du-

ties of both ITB and students were clearly defined and binding for all relevant stakeholders. The “Academic and Student Regulations” document is published under on the website. However, this site can only be accessed inside campus through intranet as the peers had been told.

The peers understood that the students received all relevant course material in the language of the degree programme including the syllabi at the beginning of each semester. In addition, most information was also available on the intranet accessible for all students.

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

Because the university abstained from a comment on this criterion the peers confirmed their previous assessment. They see the criterion partly fulfilled and recommend a requirement to add missing module descriptions and rewrite the module descriptions so as to include information about all the content and didactical methods, conditions for the award of credits (form and duration of the exams). Furthermore the recommended a requirement to make available a Diploma Supplement in English to all graduates. Statistical data according to the ECTS-Users’ guide in addition to the final grade has to be provided.

## **6. Quality management: quality assessment and development**

<b>Criterion 6 Quality management: quality assessment and development</b>
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**Evidence:**

- Self Assessment Report
- Regulations for Academic and Student Affairs Institut Teknologi Bandung, 2014.
- Discussions with representatives of ITB management, programme coordinators, lecturers, business representatives, students

**Preliminary assessment and analysis of the peers:**

The auditors were explained that the University applied two types of quality assurance system, namely the Internal Quality Assurance and External Quality Assurance systems. The Internal Quality Assurance encompasses all activities focused on the improvement of teaching and learning quality within the university. The External Quality Assurance fo-

cused on both national and international accreditation. ITB maintained a Quality Assurance Unit which was in charge of preparing the guidelines and quality standards for institutional programmes and carry out the respective activities.

In the “Academic and Student Regulations Quality” the evaluation of the lectures and lecturers were defined. The evaluations are implemented both by online and written surveys; students have to submit their evaluation results to obtain their grades which enforces high participation of the students. ITB staff members reported that they had the feeling that the questions are not always understood by the students. If staff members received bad evaluation results the Head of Department discussed this with the lecturers and possibly encouraged them to take additional didactical training. If the bad performance persisted the Dean would talk to respective lecturer. Furthermore, there was also a complaint box available which was used occasionally. The evaluation results were published in a generalized way but not for individual modules. The peers learnt that it was not a custom to discuss the evaluation results with the students; the students cannot really judge if changes take place based on their evaluation. Sometimes they get information about changes from students of the following year. The students explained that they could approach lecturers directly if they were discontent with certain aspects of a lecture and some lecturers changed the lecture according to the recommendation of the student. Even though the peers could see that the results of evaluations were used to further improve the degree programmes, they could not get a full comprehension of the feedback loops in the quality management system and recommended further developing and improving this.

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

Because the university abstained from a comment on this criterion the peers confirmed their previous assessment. They see the criterion fulfilled in general but recommended to develop the quality management system and particular consideration of closed feedback loops.

## **D Additional Documents**

No additional documents needed

## E Comment of the Higher Education Institution

The university abstained from a comment.

## F Summary: Peer recommendations

The peers recommend the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Geophysical Engineering	With requirements for one Year	EUR-ACE	30.09.2022

### Requirements

- A 1. (ASIIN 5.1) Add missing module descriptions and rewrite the module descriptions so as to include information about all the content and didactical methods, conditions for the award of credits (form and duration of the exams).
- A 2. (ASIIN 5.2) Make available a Diploma Supplement in English to all graduates. Statistical data according to the ECTS-Users' guide in addition to the final grade has to be provided.

### Recommendations

- E 1. (ASIIN 1.3) It is strictly recommended to ensure that all students get at least basic knowledge in geological core disciplines
- E 2. (ASIIN 1.3) It is recommended to increase the opportunities for students to get more practical experiences in field work.
- E 3. (ASIIN 1.3) It is recommended to offer more opportunities for the students to improve their professional skills (communication skills in general. professional English language skills, economic knowledge).



- E 4. (ASIIN 2.1) It is recommended to improve the (financial) support for students to absolve vocational practice or studies abroad.
- E 5. (ASIIN 2.4) It is recommended to improve the advisory system according to international affairs.
- E 6. (ASIIN 4.2) It is recommended to increase the technical staff in order to ensure the use of laboratories in teaching and research.
- E 7. (ASIIN 4.2) It is recommended to modernize the software equipment to allow GIS supported interpretations.
- E 8. (ASIIN4.2) It is recommend to ensure the financial basic for the continuous modernization of the equipment.
- E 9. (ASIIN4.2) It is recommended to offer more workplaces for the individual work of the students.
- E 10. (ASIIN 6) It is recommended further developing the quality management system and particular consideration of closed feedback loops,

## **G Comment of the Technical Committee (24.11.2016)**

The Technical Committee followed the assessment of the peers without any changes.

The peers recommend the award of the seals as follows:

<b>Degree Programme</b>	<b>ASIIN-seal</b>	<b>Subject-specific label</b>	<b>Maximum duration of accreditation</b>
Ba Geophysical Engineering	With requirements for one Year	EUR-ACE	30.09.2022

### **Requirements**

- A 1. (ASIIN 5.1) Add missing module descriptions and rewrite the module descriptions so as to include information about all the content and didactical methods, conditions for the award of credits (form and duration of the exams).
- A 2. (ASIIN 5.2) Make available a Diploma Supplement in English to all graduates. Statistical data according to the ECTS-Users' guide in addition to the final grade has to be provided.

## **Recommendations**

- E 1. (ASIIN 1.3) It is strictly recommended to ensure that all students get at least basic knowledge in geological core disciplines
- E 2. (ASIIN 1.3) It is recommended to increase the opportunities for students to get more practical experiences in field work.
- E 3. (ASIIN 1.3) It is recommended to offer more opportunities for the students to improve their professional skills (communication skills in general. professional English language skills, economic knowledge).
- E 4. (ASIIN 2.1) It is recommended to improve the (financial) support for students to absolve vocational practice or studies abroad.
- E 5. (ASIIN 2.4) It is recommended to improve the advisory system according to international affairs.
- E 6. (ASIIN 4.2) It is recommended to increase the technical staff in order to ensure the use of laboratories in teaching and research.
- E 7. (ASIIN 4.2) It is recommended to modernize the software equipment to allow GIS supported interpretations.
- E 8. (ASIIN4.2) It is recommend to ensure the financial basic for the continuous modernization of the equipment.
- E 9. (ASIIN4.2) It is recommended to offer more workplaces for the individual work of the students.
- E 10. (ASIIN 6) It is recommended further developing the quality management system and particular consideration of closed feedback loops,

## H Decision of the Accreditation Commission (09.12.2016)

### *Analyse and assessment for the ASIIN Label*

The Accreditation Commission discussed the report. It took some editorial changes on the requirements and recommendation and followed the assessment of the peers and the Technical Committee without any further changes.

### *Analyse and assessment for the EUR-ACE® Label:*

The Accreditation Commission followed the assessment of the peers and the Technical Committee that the learning outcomes of the programmes correspond with the criteria for the EUR-ACE® Label.

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

<b>Degree Programme</b>	<b>ASIIN-seal</b>	<b>Subject-specific label</b>	<b>Maximum duration of accreditation</b>
Ba Geophysical Engineering	With requirements for one Year	EUR-ACE	30.09.2022

### **Requirements**

- A 1. (ASIIN 5.1) Add missing module descriptions and rewrite the module descriptions so as to include information about all the content and didactical methods, conditions for the award of credits (form and duration of the exams).
- A 2. (ASIIN 5.2) Make available a Diploma Supplement in English to all graduates. Statistical data according to the ECTS-Users' guide in addition to the final grade has to be provided.

### **Recommendations**

- E 1. (ASIIN 1.3) It is strictly recommended to ensure that all students get at least basic knowledge in geological core disciplines
- E 2. (ASIIN 1.3) It is recommended to increase the opportunities for students to get more practical experiences in field work.

## I Fulfilment of requirements (08.12.2017)

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- E 3. (ASIIN 1.3) It is recommended to offer more opportunities for the students to improve their professional skills (communication skills in general. professional English language skills, economic knowledge).
- E 4. (ASIIN 2.1) It is recommended to improve the (financial) support for students to absolve vocational practice or studies abroad.
- E 5. (ASIIN 2.4) It is recommended to improve the advisory system with respect to international affairs.
- E 6. (ASIIN 4.2) It is recommended to increase the technical staff in order to ensure the use of laboratories in teaching and research.
- E 7. (ASIIN 4.2) It is recommended to modernize the software equipment to allow GIS supported interpretations.
- E 8. (ASIIN4.2) It is recommend to ensure the financial basis for the continuous modernization of the equipment.
- E 9. (ASIIN4.2) It is recommended to offer more workplaces for the individual work of the students.
- E 10. (ASIIN 6) It is recommended to develop the quality management system under particular consideration of closed feedback loops,

## I Fulfilment of requirements (08.12.2017)

### Requirements

#### For all degree programmes

- A 1. (ASIIN 5.1) Add missing module descriptions and rewrite the module descriptions so as to include information about all the content and didactical methods, conditions for the award of credits (form and duration of the exams).

Initial Treatment	
Peers	Fulfilled Vote: unanimous Justification: The university offered new module descriptions which content all asked information
TC 11	fulfilled

**I Fulfilment of requirements (08.12.2017)**

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	<p>Vote: unanimous  Justification: The Technical Committee follows the assessment of the peers without any change.</p>
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A 2. (ASIIN 5.2) Make available a Diploma Supplement in English to all graduates. Statistical data according to the ECTS-Users' guide in addition to the final grade has to be provided.

<b>Initial Treatment</b>	
Peers	<p>Fulfilled  Vote: unanimous  Justification: The university offered a diploma supplement with statistical data according to the ECTS User's guide.</p>
TC 11	<p>fulfilled  Vote: unanimous  Justification: The Technical Committee follows the assessment of the peers without any change.</p>

A 3.

<b>Decision of the Accreditation Commission on 08.12.2017:</b>			
<b>Degree programme</b>	<b>ASIIN-label</b>	<b>Subject-specific label</b>	<b>Accreditation until max.</b>
Ba Geological Engineering	All requirements fulfilled	EUR-ACE®	30.09.2022

## Appendix: Programme Learning Outcomes and Curricula

The following **curriculum** is presented:

Semester I				Semester II			
	Code	Course Name	CU		Code	Course Name	CU
1	MA1101	Mathematics IA	4	1	MA1201	Mathematics IIA	4
2	FI1101	Basic Physics IA	4	2	FI1201	Basic Physics IIA	4
3	KI1101	Basic Chemistry IA	3	3	KI1201	Basic Chemistry IIA	3
4	KU1101	Introduction on Engineering & Design I	2	4	KU1201	Introduction on Engineering & Design II	2
5	KU1011	Scientific Paper Writing	2	5	KU1072	Introduction on Information Technology B	2
6	KU1164	Introduction on Mineral & Energy Resources	2	6	KU102X	English	2
				7	KU1001	Sports	2
		<b>Total</b>	<b>17</b>			<b>Total</b>	<b>19</b>
Semester III				Semester IV			
	Code	Course Name	CU		Code	Course Name	CU
1	TG2111	Introduction to Geophysics	2	1	TG2205	Wave Theory in Geophysics	3
2	TG2101	Geomathematics I	3	2	TG2203	Geomathematics II	3
3	TG2102	Electronics in Geophysics	3	3	TG2204	Potential Theory	2
4	GL2141	Crystallography and Mineralogy	3	4	TG2240	Geophysical Computation	3
5	GL2151	Sedimentology	3	5	GD2001	Introduction on Surveying	2
6	GL2111	Physical Geology	3	6	KU206X	Religion & Ethics	2
		<b>Total</b>	<b>17</b>			<b>Total</b>	<b>15</b>
Semester V				Semester VI			
	Code	Course Name	CU		Code	Course Name	CU
1	TG3109	Seismic Refraction	3	1	TG3241	Geoelectrical and Electromagnetism	3
2	TG3110	Geophysical Signal Analysis	2	2	TG3222	Geodynamics	2

## 0 Appendix: Programme Learning Outcomes and Curricula

Semester I				Semester II			
	Code	Course Name	CU		Code	Course Name	CU
3	TG3120	Seismology	3	3	TG3262	Geostatistics	3
4	TG3106	Geophysical Instrumentation	3	4	TG3290	Field Camp Geophysics	3
5	TG3108	Geophysical Thermodynamics and Fluid Dynamics	3	5	TG3261	Seismic Reflection Data Acquisition & Processing	3
6	KU2071	Civic Education	2	6	TG3260	Gravity and Magnetism	3
		<b>Total</b>	<b>16</b>			<b>Total</b>	<b>17</b>
Semester VII				Semester VIII			
	Code	Course Name	CU		Code	Course Name	CU
1	TG4162	Interpretation of Seismic Reflection	3	1	TG4243	Volcanology and Geothermal Exploration	3
2	TG4116	Communication in Geophysics	2	2	TG4091	Final Project II	3
3	TG4169	Earth Crust Mechanics	2				
4	TG4142	Engineering & Environmental Geophysics	3				
5	TG4092	Final Project I	2				
		<b>Total</b>	<b>12</b>			<b>Total</b>	<b>6</b>

\*Compulsory Courses: 75 CU

**Table 2.8** ITB compulsory courses.

	Code	Course Name	CU
1	KU206X	Religion & Ethics	2
2	KU2071	Civic Education	2
3		Management Courses*	2
4		Environmental Courses**	2
		<b>Total</b>	<b>8</b>

Elective Course in the Undergraduate Programme in Geophysical Engineering.

No	Code	Course Name	CU	IE/RE	No	Code	Course Name	CU	IE/RE
1	TG3113	Geophysical Inversion	3	IE	14	TG4265	Seismic Attributes for Reservoir Characterization	2	IE
2	TG4028	Geophysical Exploration	2	IE	15	TG4269	Economical Geophysics and Management	2	IE
3	TG4029	Capita of Selecta in Geophysics	2	IE	16	GL2212	Structural Geology	3	RE
4	TG4063	Special Topic in Geophysics	2	IE	17	GL2213	Tectonophysics	2	RE
5	TG4067	Job Training	2	IE	18	GL2242	Petrology	3	RE

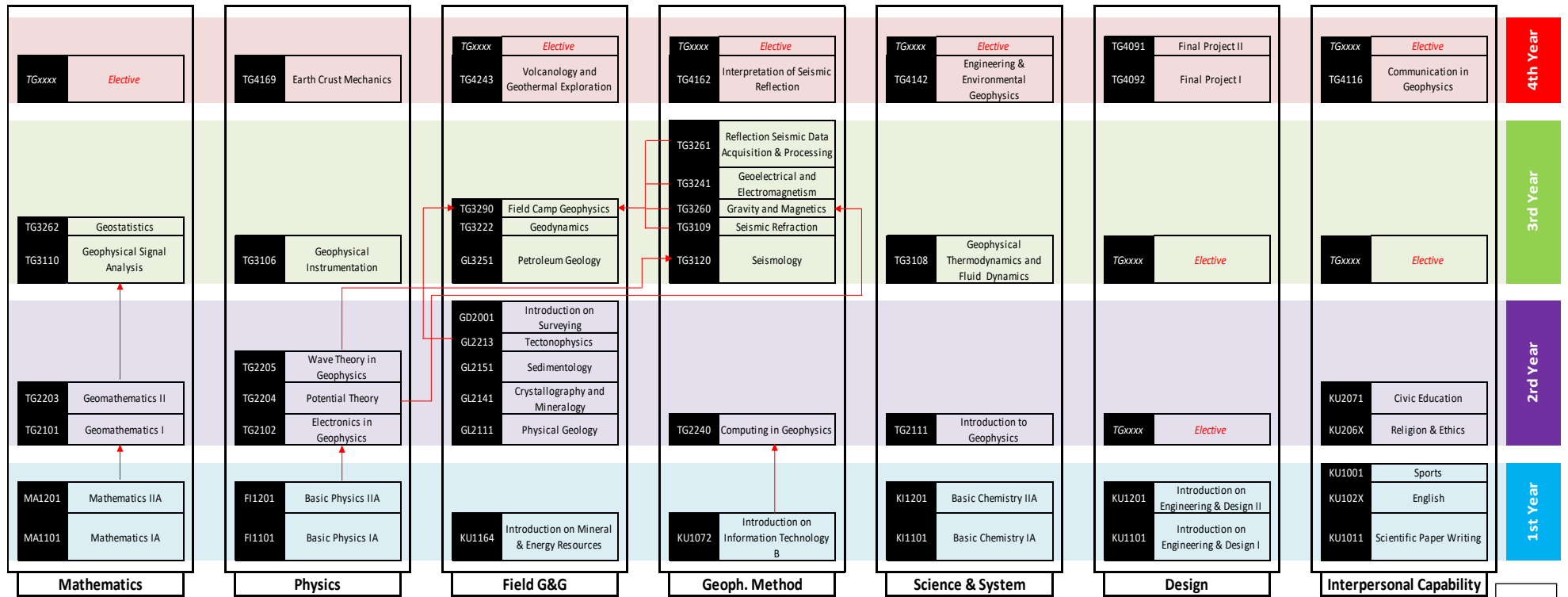
## 0 Appendix: Programme Learning Outcomes and Curricula

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6	TG4128	Geotomography	3	IE	19	GL2252	Principle of Stratigraphy	2	RE
7	TG4166	Rock Physics	2	IE	20	GL3251	Petroleum Geology	3	RE
8	TG4168	Seismic Stratigraphy	2	IE	21	GL4052	Geological Well Logs	2	RE
9	TG4223	Numerical Simulation of The Earthquake	3	IE	22	TA4102	Mineral Economics	3	RE
10	TG4225	Applied Seismology	2	IE	23	TG5133	Hydrogeophysics	2	RE
11	TG4226	Physics of the Earth's Interior	2	IE	24	TG5149	Microseismic	2	RE
12	TG4227	Fault Mechanism	2	IE	25	TG5245	Geothermal Exploration	2	RE
13	TG4264	Reservoir Seismic Inversion	3	IE	26	TG6042	Mining Geophysics	2	RE



## CURRICULA ROADMAP OF UNDERGRADUATE PROGRAM IN GEOPHYSICAL ENGINEERING - 2013



(b)



