

## **Accreditation report**

Accreditation procedure

### **European Polytechnical University (EPU) Pernik/Bulgaria "Green Energetics" (B.Sc.), "Civil Engineering" (B.Sc.) and "Earthquake Engineering" (M.Sc.)**

#### **I Procedure**

**Date of Contract:** 12/8/2014

**Receipt of self-evaluation report:** 16/3/2016

**Date of the on-site visit:** 15-17/6/2015

**Standing Expert Committee:** Engineering

**Attendance by the ACQUIN Office:** Dr. Stefan Handke

**Decisions of the Accreditation Commission:** 7/12/2015, 28/3/2017, 26/09/2017

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The **Evaluation report** of the peer group is based on the self-evaluation report of the HEI and extensive discussions with the heads of the study programmes, staff representatives, students and employers. The reviewers thank the organisers and the participating teachers and students of the on-site visit in Pernik that they were available for the discussions and have been prepared to provide information on programmes and university. The participation is perceived as very valuable not only for evaluating the programmes, but also for a better understanding of the legal and socio-cultural background of the Bulgaria higher education system, in particular the European Polytechnical University.

**Evaluation Criteria** have been the “Standards and Guidelines for Quality Assurance in the European Higher Education Area” (ESG) and – where not contradicting national regulations – the German standards for the accreditation of study programmes („Regeln des Akkreditierungsrates für die Akkreditierung von Studiengängen und für die Systemakkreditierung“) in the actual official version.

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## **II Introduction**

### **1 Short Profile of the Higher Education Institution (HEI)**

The European Polytechnical University (EPU) is the youngest educational institution in the higher education system in Bulgaria. It was founded on an initiative of a group of prominent Bulgarian scientists and recognised business representatives from various fields of science and practice and supported by private investments. The project for opening the university went through all state procedures for approval required by the Higher Education Act. The university received positive evaluation by the Bulgarian Accreditation Council (resolution of 9 July, 2009) supported by the Council of Ministers and was opened by an official act of the National Assembly in 2010.

In June 2015 the European Polytechnical University successfully passed the institutional accreditation with ACQUIN, which is based on the rules of the German Scientific Council and the European Standards and Guidelines.

With the decision of the Bulgarian Accreditation Council the European Polytechnical University has been granted a capacity of 2000 students and doctoral students and the opportunity to develop programmes in other areas of higher education and professional fields. The National Assembly authorises the university to train Bachelor's, Master's and Doctoral students in all programmes in two languages - English and Bulgarian. Since 2011/2012 the training in Bachelor's programmes has been conducted only in English language.

EPU currently offers five Bachelor's programmes and ten Master's programmes. During the academic year 2013/2014 at EPU a total 434 students were trained in five professional fields, including 302 students in Bachelor's degree (in eight majors) and 132 students in Master's degree (in 12 majors). The study programmes cover the fields of psychology, administration and management, communication and computer technology, energetics, civil engineering, architecture, geodesy and applied computer sciences.

For all programmes enrolled students have to pay fees, in Bachelor's programmes ranging from 750 Euros per semester for students from EU countries up to 1500 Euros for students from non-EU countries. Fees in Master's programmes reach from 1000 to 2000 Euros per semester.

According to the mission of EPU, the university strives to be a centre of interaction among modern education, scientific research and international academic as well as business cooperation. The university wants to personalise the relationship with its students and tries to conform to their individual abilities and preferences to prepare them for professional realisation in the market environment of a dynamically changing world. With its mission EPU seeks to distinguish the university from other universities in the Republic of Bulgaria and confirms its identity as a messenger of the progressive ideas of modern higher education with a strong focus on European development.

In the line with the attempt of integration into the European Higher Education System, EPU pursues a strategy of internationalisation. The international policy of EPU is governed by the idea of using all opportunities which the cooperation with universities, business organisations, NGOs and public authorities can contribute to its mission and strategic objectives. Further, the institutional profile of the university as polytechnic is in harmony with its internationalisation. The specialties which EPU offers are the most popular ones in the countries from where the students of the university come from. One of the ways to internationalisation is joint work with foreign universities of similar profile. EPU already concluded a number of contracts and agreements with 30 universities in Asia and Europe.

## **2 The programmes in their institutional framework**

EPU has implemented an organisational structure, which is adequate for a still comparably small university. As a key trace it is to point out that the faculty – the intermediate unit in the classic three-tier structure of a higher education institution – is conceived as redundant at present and not necessary for the implementation of the development strategy and current goals of EPU. Therefore, the university has replaced faculties by so-called programmes of Study (i.e. academic or study programme). EPU has an organisation with departments as static academic units, and the programmes of Study as dynamic units. As the closest analogy to the “programme of Study” unit EPU mentions the “specialty field” concept.

At the university the following seven departments are established: “Natural Sciences”, “Social Sciences”, “Construction, Architecture and Surveying”, “Applied Computer Sciences and Communication Technologies”, “Green Energetics”, “Economy, Management and Administration” and “Psychology”.

The study programmes “Civil Engineering” (B.Sc.) and “Earthquake Engineering” (M.Sc.) are run by the Department of Civil Engineering at EPU. For the Bachelor’s programme “Green Energetics” (B.Sc.) the Department of Green Energetics is responsible. While “Civil Engineering” (B.Sc.) has been started already in 2010, the study programmes “Earthquake Engineering” (M.Sc.) started in 2012 and “Green Energetics” (B.Sc.) was just revised in 2015, after being established in 2011.

For EPU and the three assessed programmes the practical education of modern skills and competence is important. A practical education shall be done in a real business and industry environment; therefore, the university fosters the contact with business and industry partners and receives advice from the Academic Council. The Academic Council consists of academic professors, representatives of employers, professional organisations and modern businesses.

### **III Evaluation**

#### **1 Targets of university and departments**

According to its mission statement EPU in Pernik wants to create interactions between academic teaching, research, innovations and academic-business co-operations. The university aims at the preparation of students for professional work in the market environment of a dynamically changing world. Hence, the focus is on applied research, interdisciplinarity and the denomination “polytechnical”. Further, the European Polytechnical University is committed to introducing the European standards in education, offering instruction of contemporary educational content, developing a faculty of scholars from European universities and international academies, carrying out teaching and evaluation according to the latest methods in an avant-garde professional environment, and instilling in its students the values of European civilisation. Following this strategy, EPU defined students from abroad as the main target group, who are interested in Europe and who share European ideals. The regional focuses of students to be attracted are south-eastern Europe, Asia and Africa. Since the Lisbon convention on the “Recognition of Qualifications concerning Higher Education in the European Region” is implemented at the university, the option of academic mobility is guaranteed for students and graduates of EPU.

Due to its profile and its features – especially the in Bulgaria unique offer of study programmes taught in English –, the programmes are competitive in the education market. The market position has been analysed in detail and it is obvious for EPU that job perspectives in Bulgaria are not the best for graduates in all disciplines. Therefore, the university tries to attract students from abroad, mainly from Greece, Turkey or Nigeria. The group of experts explicitly encourages EPU to pursue this strategy and to expand promotion measures.

#### **2 Bachelor’s programme “Green Energetics” (B.Sc.)**

##### **2.1 Targets of the study programme**

###### **2.1.1 Short summary of the study programme**

The overall target of the Bachelor’s programme “Green Energetics” (B.Sc.) is to educate qualified engineers for working in the field of alternative energy engineering. A focus is on renewable energy techniques and energy efficiency. Due to the fundamental education in principles of engineering, graduates should also gain knowledge in mechanical and electro technical engineering.

“Green Energetics” is a 4-year full time programme requiring accomplishment of courses in an extent of 240 ECTS credits. The programme incorporates 55 courses in order to provide a comprehensive understanding of the field. For admission to the programme, a semester-tuition-fee of 750 Euros and 1500 Euros for EU-students and for Non-EU-students, respectively, has to be paid. Fee reductions are provided as incentive for well-performing students.

The field of renewable energy is rapidly growing which will lead to a rising demand of specialists in the markets in Bulgaria and all over Europe. The EPU staff members claim the programme “Green Energetics” to be a unique one compared to the study programmes at Bulgaria’s state-universities. This USP should attract Bulgarian students. Non-Bulgarian students should also be attracted due to the fact that the programme is completely taught English. Furthermore, it is flexibly oriented towards the market’s demand, and, nevertheless, delivers European values shared by all educational programmes of EPU. From the reviewers’ perspective, the idea of the programme seems to be promising.

As for the development of the qualification targets, the reviewers see the framework of the study programme in coherence with similar programmes in Europe. In its self-assessment report, EPU claims that modern methods of teaching and learning, modelling, simulation and optimisation are applied in the programme. Although the proportion between lectures, seminars and lab-exercise seems to be appropriate, the lab-facilities on site in Pernik do not show the state-of-the-art and cannot guarantee high European research standards. The reviewers strongly recommend improving this lack once the programme reaches a critical mass of enrolled students.

### 2.1.2 Objectives and competences

The objective of the programme is education in renewable energy engineering at an applied level. Normally, technical universities build their energy-engineering programmes upon a broader fundamental basis. With its practical approach, the EPU programme is more in line with programmes at universities of applied science.

According to the academic curriculum, the programmes’ framework allows for adequate education to gain appropriate professional competences in this field. In “Green Energetics” courses in Thermodynamics and Heat-Transfer, Fluid mechanics, Electrical power systems and machines have to be accomplished, giving graduates professional competences in energy-related engineering subjects. In addition, the programme covers renewable energies as wind-power, solar-energy, and biomass- as well geothermal-energy. Completed with courses in energy-efficiency, safety environment and energy-friendly building design, “Green Energetics” seems to be comprehensive. However, it is very unusual that no aspects of hydro-power, especially thermal power engineering, are studied. There are also no courses giving competences in numerical simulation methods. The reviewers recommend providing such courses, at least as electives.

Generic competences are procured in compulsory subjects as “Economics” and “European Values and Cultures”. There are also required courses in generic topics related to the field of green-engineering as “European-Policies and Standards” and “Energy Management”. Quite a broad range of generic electives are offered. The choice of courses reaches from philosophy and law, over project-management to French and Russian language. There are no courses offered in order to learn professional English. The reviewers strongly recommend offering such courses, at least as electives.

Since the programme is more dedicated to practical applications, there are less methodological competences procured as with technical universities. This is also due to the fact that programmes in energy engineering are always interdisciplinary and, therefore, not as methodology oriented as the conventional engineering disciplines. From the reviewers’ perspective, the methodology competences are not appropriately addressed in the programme. As an accreditation condition, EPU has to develop guidelines for all technical subjects in order to improve this.

#### 2.1.3 Personal development and capability for civic engagement

Within the programme students acquire a solid interdisciplinary basis for the beginning of a professional career in the area of green energetics. As for personal development, students have a possibility to study in an international environment and strengthen their intercultural competences.

As the marketing concept of the university is based on oral advertising provided by the students themselves, already at secondary school they get to learn about the European English speaking programmes of EPU und get prepared for the complex challenge of studying under new circumstances. Throughout the years of study they get used to working in a foreign language which makes them ready to work both in their home countries and abroad.

Students getting enrolled at EPU, pay for their study. The ones, who were present at the on-site meeting with the reviewers, were partially children of well-situated parents and owners of companies dealing with green business in their home countries. Through studying together, the students get the possibility to make important personal business contacts at a very early stage of their professional pathway. Living in a foreign country, the students learn to get together and to help their international fellows in difficult study- and personal life-related situations.

#### 2.1.4 Employability

As there are no students having completely finished the “Green Energetics” programme yet, no evidence of employability can be stated. However, the question of students’ employability seems to be the major one for all members of the teaching and administration team of the faculty and university.

The teachers design their courses in a way that practical aspects are introduced in therein. Using their personal professional networks, the teachers build the bridges between the students and possible future employers negotiating internship options and preparing long-term cooperation agreements between the university and the private companies.

In parallel to negotiations with individual companies, the faculty has signed cooperation with the Bulgarian Construction Chamber and provides practical courses for the Chamber members who, in return, organise practical training for the EPU students.

Within the cooperation with the National Organisation on Electromobility (NOE), mutual curricula with industrial focus are elaborated addressing recent industrial requirements and needs. Furthermore, joint events are organised for the students of EPU in collaboration with NOE.

The career centre of the university administration also conducts a comprehensive search on new challenging internship possibilities for the students and encourages them to participate in new programmes. Thus, the students receive a major help in getting in touch with the entrepreneurship in Bulgaria and abroad directly during their studies at the university.

#### 2.1.5 Conclusion

Through the introduction of the new future-oriented Bachelor's programme of "Green Energetics", EPU has gained a further unique selling point attracting Bulgarian and international students. The initial phase of the programme introduction seems to be pretty tough. Only 7 students are currently enrolled. According to EPU's statements, due to visa problems, 25 students from Nigeria were not allowed to start in 2014. Consequently, more work shall be done by the administrative staff of the university to facilitate visa procedures for future students of the programme.

## 2.2 Concept of the study programme

### 2.2.1 Structure of the study programme

The 4-year programme contains courses in the extent of 30 ECTS credits each semester. Only the first semester is dedicated to basic natural scientific training in subjects as mathematics, physics and chemistry. Fundamental engineering subjects such as CAD, electrotechnics, thermodynamics, heat- and mass transfer, fluid-mechanics or material-science are covered in semester 2 and 3. In the later semesters the practical orientated competences in the field of renewable-energy are procured. From the first semester on, elective modules are implemented. Each module consists of 3 courses where one must be chosen. According to the academic standard, besides the Bachelor-Thesis scheduled in the semesters 7 and 8, there are written works to be done in Photovoltaics and Heating- and Cooling-Systems. In the eighth semester industrial placement is scheduled. In

comparison to other programmes the elective opportunities in each module are rather small. With a rising number of students enrolled, a broader variation should be offered.

Concerning the appropriateness according to the educational level, the reviewers checked some courses in detail.

#### Thermodynamics and Heat-Transfer:

The check was done only on the submitted academic-standard. The aim of the course is clear. The processed topics are relevant. It is embraced that the course implements a lecture, a seminar as well as lab training.

#### Biomass-Energetics

The check was done on the submitted academic-standard, selected lecture slides and an examination questionnaire. The aim of the course is clear. The processed topics are relevant. The applied teaching-methods are adequate. In contrast to most courses on biomass-energy there is a focus on cold conversation technologies.

#### Green-Energy and Safety Environment

The check was done on the submitted academic-standard and selected lecture slides. The aim of the course is to state the importance of environmental protection especially by means of using sustainable energy. So it is recommended to rename the course (Green Energy and Sustainable Environment). The processed topics are relevant. The applied teaching-methods are adequate.

Furthermore, a brief check shows mistakes in the curriculum:

- GEB731 is not Thesis I;
- Industrial placement includes a self-study part which is obviously a self-study programme under supervision of a responsible member of the placing company.
- There is an exam on the industrial placement. Here it is unclear which practical competences can be assessed and on which basis the equality of the assessment can be introduced for the placement in different companies. Also the descriptions of the preparation for such an exam are missing.

The reviewers strongly recommend to correct the curriculum according to the remarks stated in this report.

#### 2.2.2 ECTS and modularisation

Each semester students have the possibility to accumulate 30 ECTS credits, which are 240 ECTS credits within the 4-year programme. For one credit 25 to 30 hours of student's work are taken as a basis. Credits are assigned based on the expected curricular and extracurricular workload

necessary to complete course and are awarded based on examinations during or at the end of a course. Furthermore, credits are awarded for a thesis (25 ECTS credits).

Alongside with credits, students also receive grades according to the grade system valid in Bulgaria. There are courses that are finished by an exam with a grade indication. Other courses are completed with a remark “passed” or “failed”. The course results are generated in the university statistics which is also available for students via the intranet programme on the EPU’s website.

For the Bachelor’s thesis the students can acquire 25 ECTS credits, which is at least double as much as at other universities in the EU.

The workload for the achievement of the set goals seems to be feasible. In the onsite discussions with the students the reviewers did not notice any prominent complains concerning the workload and preparation of the course assignments.

### 2.2.3 Teaching methods and study contexts

Adequate teaching methods are implemented at EPU for the proposed higher education programme. The reviewers have learned that there is intensive contact between the students and lecturers. For instance there is mandatory attendance to all courses. This intensive collaboration leads to an effective transfer of knowledge.

In order to effectively provide teaching-material to the students (e.g. scripts, lecture-slides, calculation examples), a modern online system (Moodle) is used. Textbooks can be downloaded from the universities’ library via the available intranet. As the university’s own library is not well equipped, there is a close cooperation with the Bulgarian Academy of Science, providing access to much versatile resources also in the form of online-databases and online-journals.

Most of today’s students in “Green Energetics” are Bulgarians. Thus, some teachers tempt to switch to Bulgarian when discussing practical issues during the courses. As teaching in English is one to the USP of the programme, it is recommended doing so, also if all students are Bulgarian native speakers.

### 2.2.4 Conclusion

EPU has demonstrated a well-elaborated extensive “Green Energetics” programme which has been put in place 2011. During the last four years, the university has enrolled seven students and is working on the further extension of the students’ numbers in Pernik. The admission criteria for the programme are clear and open for public. However, when it comes to the enrolment of students from other universities, the EPU staff members should consider recommendations mentioned by the reviewers of this report.

The mandatory parts of the curriculum are well-structured, state-of-the-art and convey the solid basis for the addressed field. However, the labs do not meet the European research standards. A bit more elective opportunities would be useful.

### **3 Bachelor's programme "Civil Engineering" (B.Sc.)**

#### **3.1 Targets of the Bachelor's programme**

##### **3.1.1 Short summary of the study programme**

Construction industry is one of the most important industries both in the individual countries as well as in the European Union and it is one of the main driving forces of the economic development. This industry comprises residential and public buildings, as well as facilities, such as dams, roads, bridges, tunnels, etc. The Bachelor's programme "Civil Engineering" focuses on preparing the students for the needs of the construction industry by educating them to be specialists with good theoretical knowledge and practical skills. This ensures their adaptation and realisation in the construction practice.

The Bachelor's programme "Civil Engineering" offered by the European Polytechnical University is designed in consideration of the requirements of the mentioned construction industry and also the social responsibilities. Through relatively modern teaching and research methods and with the participation of foreign tutors, students acquire the required preparation at a European level.

From the reviewers' perspective the idea of the programme is positive and the objectives and curricula of the study programme are clearly aligned and defined. The Bachelor's programme is a four years (8 semesters) programme, with 240 ECTS credits.

##### **3.1.2 Objectives and competences**

The goal of the Bachelor's programme is to provide the students with knowledge, skills, habits, attitudes and values, relevant to the contemporary rapidly developing construction practices and technologies. This way, the graduating students will have high adaptability in market environment and readiness to respond to the need of modern and mould-breaking specialists in civil engineering.

The curriculum of the programme includes 51 courses. Despite the fact that the instruction will be mainly in English the curriculum does not have any course in professional scientific/technical English language.

The programme offers scientific and practical, job-oriented knowledge and skills, prepares students for employment flexibility and for further study. New construction technologies are integrated and the student's creative potential is developed. The programme provides in-depth training in general theories and in courses, which cover all major aspects of the work of the future graduate. Through the activities provided in the auditorium and extracurricular activities and self-preparation students can improve their knowledge and skills in order to meet the requirements of today's rapidly developing construction industry.

The Bachelor's programme includes basic wide-profile training in the important fields of construction materials, energy efficiency and sustainability, construction management, civil engineering informatics, structural design, reconstruction, engineering surveying, geology and hydrology.

The engineers graduating in the bachelor programme "Civil Engineering" will be qualified to carry out the following activities:

- Design, construction and operation of buildings and facilities
- Implementation and operation of construction machinery, specialized technological equipment and facilities for construction works
- Operation and maintenance of information tools and technologies for marketing purposes in the field of construction technologies
- Engineering and software development for computer-aided management of construction projects
- Quality assurance of the accomplished construction projects through measurement and control of the parameters of construction works, and application of digital processing and information storage methods.

From the reviewers' perspective, the subject related competences are sufficient, but methodology competences are not appropriately addressed in the programme. As an accreditation condition, EPU has to develop guidelines for accurate delivery of scientific work for all technical subjects in order to improve this. The guidelines should cover aspects e.g. of quotations, intellectual property and contain templates for the preparation of oral and written papers and examination works.

### 3.1.3 Personal development and capability for civic engagement

EPU in Pernik trains students to acquire educational and qualification degrees of "Bachelor" and "Master". Given the international orientation of the programme, the mandatory course on European values and culture will certainly be beneficial for students, and helps to integrate students from diverse cultural backgrounds. Up to the time being, they come from about 10 countries:

Bulgaria, Greece, Norway, Nigeria, Ghana, Cameroon, Turkey, Iraq, Macedonia, Pakistan, Dubai, India, Kosovo and Italy. The majority are yet from Turkey and Greece. The relative share of the foreign students is about 83 percent.

The lectures and study materials are in English. Even if the admission requirements demand the certain level of English and there are preparatory courses for the candidates with inadequate level of English language before enrolling the study programme, there is no course in the study programme that would teach students scientific/technical English. The reviewers suggest including such a course in the curricula, since the understanding of professional terminology is crucial for personal development and career prospects.

#### 3.1.4 Employability

The graduates of the Bachelor's programme "Civil Engineering" will be prepared to find employment in companies, technical offices, organizations and institutions on all fields in the construction industry. The graduates of the specialisation Civil Engineering will also be able to start their own businesses as they will have the skills to assess and implement a construction project from start to finish. They will also be able to find employment as company managers, as sales representatives or distributors.

#### 3.1.5 Conclusion

The objectives of the programme are to develop Bachelor graduates with extensive basic general knowledge for practical work in the construction sector. The objectives, content and variety of courses are well aligned. The curricula could yet be further developed perhaps by introducing more courses as electives in the field of energy efficiency and sustainability. Technical/scientific English should be introduced. Furthermore, the content of the discipline "Building Physics" has to be updated and must comply with the agreements of the "European Standing Committee of Professors of Building Physics and Technical Building Services".

### **3.2 Concept of the study programme**

#### 3.2.1 Structure of the study programme

The bachelor programme is a four years (8 semesters) programme. The study programme contents are harmonised with the university in Ulster, where most of the students from EPU in Civil Engineering will study one semester of their education, since one semester is studied at a foreign partner university.

The study plan of the Bachelor's programme in civil engineering includes at the beginning the discipline „Introduction in the specialty“, which is run and taught by the leader of the programme

with participation of guest lecturers who are mainly representatives of companies in the specific field of construction industry. Furthermore, practical classes in companies from the construction industry, as well as visits to construction sites and enterprises for production of structural materials are being planned and carried out. The study programme in Civil Engineering is orientated to the English speaking foreign students with following the background:

- teaching the students to freely use high technologies to assist their taking of responsible decisions in the engineering practice;
- the management, technology and organisation of construction,
- the complete studying of the new standards and Eurocodes in the field of construction, and the requirements for improvement of energy efficiency of the buildings and for observing the requirements for conformity of the construction products.

In the training process guest lecturers participate and in the practice orientated disciplines (Engineering geodesy, Chemistry in construction, Technology of construction, Construction materials, Structural building materials, etc.) representatives of companies in the specific field of industry and of companies including manufacturers of construction products participate. Practical classes at the construction sites are held along with visits in scientific centres (units of the Bulgarian Academy of Sciences).

Such guest lectures and visits are organised in the disciplines "Construction chemistry", "Engineering geodesy", "Engineering Geology and hydrogeology", "Technology of construction", "Construction machinery" and "Mechanics and Sustainable development". The discipline „European values and culture“, led by a professor from the university in Upsala – Sweden in the first semester, orientates the future engineers towards Europe and its cultural, technological and human values.

In summary, the study plan includes the following important components. First, mandatory projects in semesters 4, 5, 6 and 7, which are fully practically orientated and often assigned by proposal of company structures, which on some occasions provide a consultant for the project. Second, technological and laboratory practice, led by real working representatives of the business. Third, individual course works in electable disciplines selected by the student with topics also orientated to the direct application in the construction business.

The Bachelor's programme „Civil Engineering“ and its taught disciplines are closely connected with the needs of the construction practice, the scientific research in the construction industry and the scientific research of the lecturers. Achieving of the connections specified is implemented by the participation of representatives and specialists from the construction business (design, construction and operation of buildings and facilities) in various regards, such as the determination

of standards of the disciplines taught, or the participation in the study process through lectures by leading builders and designers.

Results from the scientific research of the lecturers in the lecture materials are included in teaching and students are attracted to research teams and they participate in scientific events in the seminars and in the conferences of EPU.

### 3.2.2 ECTS and modularisation

The duration of the studies in the Bachelor's degree programme in "Civil Engineering" is four years, with 240 credit points, two semesters per year, each with duration of 15 weeks. Like in other study programmes, EPU calculates the workload in the Bachelor's programme with 25 to 30 hours as the basis for one ECTS credit.

In the programme's structure there are 45 obligatory, 5 elective and one facultative course, with 3076 hours in the academic curriculum (1560 lectures, 255 seminar exercises, 990 laboratory practice and 271 practical classes). The individual student work is being estimated by the half of this time.

The overall weekly student workload is about 50 hours of contact and independent study with the exception of the last semester. According to the reviewers the workload is high, but manageable and adequate from the student's perspective. Therefore, the structure of the programme guarantees the academic feasibility.

### 3.2.3 Teaching methods and study contexts

EPU implements contemporary teaching methods to empower students with competencies such as taking initiative, creativity, independence, as well as taking responsibility for one's own development, failures and successes. Students learn how to plan and work towards their own development. According to the programme and course syllabuses, teachers foster active participation and discussion of the students during course sessions. They encourage creative thinking and problem solving. Further teaching materials such as textbooks, which teachers are obliged to write under EPU regulations, are also made available to students online. Seminars are conducted in individual work and teamwork. Furthermore, technological and laboratory practice is being enforced.

Examinations comprise written and oral exams, including student presentations throughout the semester, to ensure required competencies and learning of the study material. It is planned to ensure teaming up students with teachers or professionals from the construction industry to work on joint projects along with their ongoing classroom.

The courses are mainly taught in English. Teachers are expected to be very good in English. Nevertheless, it is suggested that also teachers should take regular seminars on professional technical/scientific English language.

#### 3.2.4 Conclusion

The expert group is convinced that the Bachelor's programme "Civil Engineering" is backed by very active and motivated staff members. Except for the shortcomings described above, the reviewers believe the study programme to have a sound concept. Solely, the content of the discipline "Building Physics" has to be updated and must comply with the agreements of the "European Standing Committee of Professors of Building Physics and Technical Building Services".

## 4 Master's programme "Earthquake Engineering" (M.Sc.)

### 4.1 Targets of the study programme

#### 4.1.1 Short summary of the study programme

The Master's programme "Earthquake Engineering" (M.Sc.) has the stated objectives of developing the expertise and skills of qualified civil engineers in the field of earthquake resistance of buildings and infrastructural facilities, at both design and construction stages. The study programme is open to candidates with previous degrees in civil engineering. It is intended for those graduates in civil engineering who wish be admitted to specialization in earthquake engineering, in order to be capable of designing new earthquake-resistant buildings and infrastructural facilities, or interventions to strengthen existing buildings and infrastructural facilities against seismic action, as well as of rehabilitating buildings damaged in seismic action. The stated objectives also include the training of specialists who are capable of certification of buildings for the purpose of insurance, as well as advising on earthquake risk reduction.

#### 4.1.2 Objectives and competences

The stated objectives of the study programme are to prepare graduates for the careers of specialists consulting engineers, of researchers in the field of engineering in seismic areas; of managers of programmes of aseismic strengthening, repair and reconstruction of seismically damaged buildings; of professionals working in the area of construction quality, and the development of building codes, standards and guidelines. The stated objectives also go on to include preparation for careers of marketing specialists, technical supervisors, consultants and managers in business companies, and public and international institutions.

The required competences should include the ability of specialist civil engineers to understand the nature of earthquakes, the impact of geo-technical conditions on seismic risk, and the performance of buildings and infrastructural systems under seismic excitation. It is also necessary for the successful specialists to be familiar with the numerical methods of analysis of seismic response, and to understand the requirements of building codes, in the European Union harmonized in EN 1998, but which may be different in other countries. The ability to design buildings in the main engineering materials, such as reinforced and pre-stressed concrete and steel, the ability to understand the effect of the construction processes on seismic performance, are other important competences. In some countries, particularly those where there are many heritage masonry structures, it is also important for the earthquake specialist to understand the principles of seismic behaviour of masonry buildings, in qualitative terms if not in numerical terms, and the effect of possible strengthening techniques. The specialist engineers should also be familiar with the technologies of monitoring the response of buildings, and with the tools available for the simulation of building response, and their limitations.

#### 4.1.3 Personal development and capability for civic engagement

The area of earthquake engineering specialisation is a wide one, and is one which is important, in many seismically-active countries, to ensure the safety of people, particularly in urban areas. Earthquake engineering specialists have the opportunity to directly contribute engineering solutions to the problems of earthquake risk and hazard, but also to influence the development of policies and regulations to reduce risk and hazards.

#### 4.1.4 Employability

It follows, from the above, that a good Earthquake Engineering specialist programme offers many opportunities of employment to successful candidates.

#### 4.1.5 Conclusion

The targets of the study programme are well-defined, if, perhaps, ambitious in consideration of the duration of studies envisaged. The area of earthquake engineering is an important one, relevant for the safety and protection of people. It is also an area that is still evolving, requiring more research work to be able to better define seismic risk, and to predict the seismic performance of some types of buildings, particularly existing heritage buildings.

The programme was in its first year of operation and the absence of alumni makes it difficult to assess employability of graduates, and whether the programme is attaining its objectives.

## 4.2 Concept of the study programme

### 4.2.1 Structure of the study programme

The study programme with 90 ECTS credits is divided into three semesters, that is, it is spread over a period of ca. 18 months. It comprises 5 mandatory and 1 elective subjects in the first semester, 4 mandatory and 2 elective subjects in the second semester, and 2 electives and the Diploma thesis in the third semester. The Diploma thesis is required to include elements of scientific research. The programme prescribes a workload of 480 hours of lectures and 375 hours of seminars over the three semesters, that is, a total of 855 hours of formal teaching.

The mandatory subjects are "Introduction to engineering seismology and seismic zoning", "Geotechnical aspects of earthquake engineering", "Dynamics of Structures", "Numerical methods of engineering analysis (inc. seismic codes)", "Restoration, strengthening and repair of structures for seismic resistance", "Design of concrete structures", "Design of steel structures", "Special and Infrastructural aspects of earthquake engineering" and "Control systems and Information Management".

The elective subjects are divided into two groups, and students have to choose two from each group. The first group comprises "Introduction to Classical Seismology", "Construction of Reinforced Precast Concrete", "Preservation of Cultural Heritage in Seismic areas" and "Modern Computational Methods". In the second group the modules "Theory and Methodology of Reconstruction of Buildings", "Geotechnical problems of Buildings and Facilities Reconstruction", "Simulation and Modelling of Strong Ground Motion" and "Reconstruction, Restoration and Conservation of Cultural Heritage Buildings" are located.

One elective subject has to be selected in each of the two semesters of the first year, whilst two elective subjects have to be taken in the last semester.

### 4.2.2 ECTS and modularisation

Each semester carries a total of 30 ECTS credits; therefore 90 ECTS credits are acquired in the Master's programme. The elective subjects carry 2 ECTS credits each, whilst the mandatory subjects carry 5 to 7 ECTS credits each in the first semester and 7 ECTS credits each in the second semester. The Master's thesis carries 26 ECTS credits of the third semester.

The workload for the achievement of the set goals seems to be feasible. In the onsite discussions with the students the reviewers did not notice any complains concerning the workload and preparation of the course assignments.

#### 4.2.3 Teaching methods and study contexts

The course curriculum document prescribes the teaching methods adopted in the programme. They comprise formal lectures, typically 14 hours per week in the first two semesters; seminars, typically 2 hours per week in the first semester, and 7 hours per week in the second; Laboratory sessions, 8 hours per week in the first semester and 3 hours per week in the second; and 1 hour per week of “Practical Training/Fieldwork” in the second semester. In addition to the 24 to 25 hours formal teaching per week, candidates are expected to spend time on self-study, such that the load per week is 52 hours. In the third semester, the Master’s thesis includes 5 hours per week in seminars, and considerably more self-study time, so that the total load per week is also of the same order.

#### 4.2.4 Conclusion

The programme curriculum appears to be well designed, and covers the most important aspects of earthquake engineering specialisation. The teaching load, and the mix of teaching methods, between lectures, seminars, practical projects and coursework, seems appropriate. However, it would be better for the curriculum document to define more clearly the expected learning outcomes for each of the subjects covered, as well as the expected competences. Each subject should also have recommended reading lists.

The balance of ECTS credits appears to be appropriate, and the weighting of the Master’s thesis laudable. Since the latter thesis includes elements of scientific research, part of the programme ought to be devoted to helping students with the correct research methodology, including methods of proper literature referencing, safeguards against plagiarism, etc.

The elective subjects offer a reasonable supplement to the mandatory subjects. Since an important stated objective is the ability of specialist earthquake engineers to offer advice in the upgrading, repair and reconstruction of existing buildings, also with reference to cultural heritage buildings – which are probably not built in reinforced concrete or steel, it could be argued that some teaching of design and behaviour of masonry structures would be appropriate.

The programme was in its first year of operation when the evaluation visit was carried out, and it is therefore difficult to assess the efficacy of the curriculum.

## 5 Implementation

### 5.1 Resources

#### 5.1.1 Personal resources

The sufficient allocation of personal resources is a prerequisite for the approval of a study program by the Bulgarian national administration. Therefore the curriculum is by definition sufficiently equipped with lectures and professors. The staff of EPU in the study programmes assessed (Civil Engineering, Earthquake Engineering and Green Energetics) is mainly recruited from the Bulgarian Academy of Science and other National Universities, partly the lecturers have also a professional background in engineering praxis. Most of the lecturers and professors are senior experts in their field, partly in the retirement age. Partly professors hold their position at EPU as a second position besides teaching, research and professional commitments elsewhere. Therefore the average age of the faculty at EPU is currently probably higher than at other university. In future, when student numbers raise and the operation of the study programmes is more established, it is planned to recruit younger staff for the longer term operation and further development of the programmes. The students expressed that they are satisfied with the support of the staff and the professors and that regard the professors as suitable in their positions.

The English skills of the teaching staff seem to be sufficient; however teachers should be encouraged to update their English skills regularly. In general, a further education programme for teaching staff should be provided and English skill must be made condition for the assignment of teaching tasks in the programme. This is especially important since students from various language backgrounds will be educated in the programme.

#### 5.1.2 Financial Resources

A financial budget is provided with the documents for the entire university. EPU will be financed by tuition fees of students, donations and yields from parents. The tuition fees for the three programmes (Civil Engineering, Earthquake Engineering and Green Energetics) assessed are currently at 1.500 Euro, with a reduction to 750 Euro for EU-Students for the programmes "Civil Engineering" and "Green Energetics". Funds for research are acquired from Bulgarian Government and also from private donors or international institutions. It is planned to apply for funds from EU research programmes.

#### 5.1.3 Infrastructural Resources

The university infrastructure seems to be acceptable for three study programmes assessed (Civil Engineering, Earthquake Engineering and Green Energetics) in the starting phase of the programmes and the university as such. Nevertheless, infrastructural (laboratory) resources are currently limited, and students have access to a limited selection of e.g. seismological instruments,

but not to the possibilities offered by a laboratory with facilities to test reinforced concrete, steel or masonry structures, in dynamic conditions, even if in a reduced scale.

There are plans to move (or to extend) the university to a new building near the current EPU location. Within the new building class rooms, offices, laboratories and a new library will be installed according to the presented plans. However the building progress for this new building appears to be delayed and it can be expected that the facilities will not be available before end of 2016 or later. However, especially for the engineering discipline, own and local laboratories and testing facilities are recommended to be built up in the future.

Since the university currently has only rudimentary own equipment, EPU is collaborating with the Bulgarian Academy of Science and other national research laboratories in Sofia to make up for this shortcoming. The students have access to these facilities for their study works and exercises.

There is a library with a small number of books in the EPU building available for the students. Otherwise the students have access to online-libraries supported for EPU by collaboration with Bulgarian Academy of Science and they have access to the library of a larger national university in Sofia. At least through the online resources literature in English language is available. The online resources include the databases of: SciVerse® ScienceDirect®, SciVerse® Scopus®, Web of Knowledge and also provided audio materials in English – Headway Class Audi CD Oxford. Students mostly use e-material provided by their teachers and do not use the other library infrastructures frequently. The library reading room has a seating capacity of 20 users; the work stations are outfitted for laptop use and offer Wi-Fi Internet. Plans to increase the amount of available computer and work places are mentioned in self-report documents provided.

It was demonstrated that students have access to computer facilities, but it is not clear whether these are equipped with specialist earthquake engineering software. Access to a selection of the main English-language journals in seismic engineering, in the library or preferably in the laboratory, is strongly recommended, since this would give students the opportunities to become more aware, even in an informal way, of the current issues in earthquake engineering.

## **5.2 Organisation, counselling and cooperation**

### 5.2.1 Organisation

Responsibilities and relations of the programmes and units at the university are clearly defined. The decision making processes within EPU are well documented. First is the primary level: departments and their teachers. And second on the university level: the University Administration, which consists of the Rector and the Vice Rectors, the Resident and the Academic Council.

The Programme Board is a collective body appointed to manage the so-called Programme of Study and its activity is overseen by the Chair of the Board. In general the administration staff ensures the supervision of students. The support staff at EPU adequately uses technology to deliver an effective range of coordinated services for each student.

### 5.2.2 Cooperation

EPU has established cooperation on various levels. In the first place the collaboration between EPU and the Bulgarian Academy of Science to access the library and online database. This collaboration also provides access to laboratory facilities and senior scientist as professors for the programmes at EPU. EPU seems to be well integrated in the education system of Bulgaria and the academic community.

EPU has a cooperative approach to networking with other HEIs, research institutions and representatives from business and administration. But so far there is no concept of regular and organised involvement behind this, especially for the business sector. In the academic and research sector collaboration contracts are established. Collaboration with the business sector could be strengthened through formal establishment of advisory boards and other contractual arrangements in order to align the university activities with the needs of future employers of the graduates. This could go along with the planned establishment of the career centre and the internship placement at EPU.

Through contracts (and personal relations of the senior professors) EPU has secured availability of the currently missing facilities for laboratory exercises in the engineering disciplines. During the audit a concrete laboratory for the civil engineering students took place in the facilities of the National Material Testing Laboratory.

EPU has established international collaboration with the University of Ulster, which provides online lectures and sends lecturers to Pernik to teach regularly in block modules. Also student exchange is foreseen in the agreements between EPU and Ulster University based on EU funding. Other international collaboration exist (or are currently being established) with one university in China for a double degree programme in "Green Energetics" and with two universities in Kazakhstan for student exchange. At the time being, the university is negotiating double-diploma and exchange programmes with partner universities in China and Kazakhstan. Further partnerships especially for the "Green Energetics" programme are welcome.

Within the planned cooperation with the Chang Chung University, a 2-2 year programme is negotiated. Chinese students will study two years at their university and come to finish their Bachelor's programme at EPU within the following two years. As there is no specific regulation on how the Chinese students will be assessed, the reviewers recommend to introduce an annex to the partnership agreement comprising such a standardised regulation based on the context-related

requirements of the programme to be settled down by the teaching staff of the programme. This annex may be updated once there are changes in the teaching programme of the Chinese partner university.

In order to be able to elaborate the annex with regulations proposed above, a detailed exchange and mutual curricula analysis shall be conducted by the EPU staff members and their Chinese colleagues.

Within the cooperation with Kazakh universities, partnership agreements with two technical universities in Karaganda are currently negotiated. In this case, the Kazakh students are encouraged to start their Bachelor's studies at their home university and continue them after the first year within a three-year course programme at EPU. The planned 1-3 year programme foresees the enrolment of approx. 20-25 students starting in winter semester 2015/2016. Also for this cooperation programme the reviewers recommend to negotiate special admission criteria for the students and to set them mutually in an annex to the planned partnership agreement.

### 5.2.3 Counselling

The programme management, teachers and support staff provide personal counselling and advice to students and faculty members where necessary in respect to their studies, academic issues and organisational issues. For instance, an official contact person for student affairs is named. Applicants and students are substantially supported in regards to visa requirements, since most of the students at EPU come from abroad. Placement in internship and work positions is supported and in future a formal career centre will provide related services to the students. Also support for daily issues of living and organisational issues around the studies is provided.

## 5.3 Admission criteria and recognition of competences

The admission criteria are set in a special guide provided on the website of the university. Documents required for the admission in the Bachelor's programmes "Civil Engineering" and "Green Energetics" comprise some application forms and several certificates, e.g. an official secondary education diploma, a transcript of the diploma with the marks for all the years of education, or a document issued by the graduated high school that allows the student to continue in higher educational system (university) in his/her country and abroad (for non EU citizens), legalised by the authorities in the graduated country.

The Master's study programme "Earthquake Engineering" is open to candidates with good first tier (Bachelor) or second tier (Master) degrees in civil engineering, from a recognised educational institution. The language of teaching is English, and therefore candidates have to demonstrate a

specific level of proficiency in English, before being admitted to the course. The required competences are not formally stated in the curriculum documents, but the topics covered, as defined in the curriculum document, suggest that the required competences are well understood.

Documents for the application must be originals or notarised copies and must be officially legalised in the country, where the education has been obtained, then translated into Bulgarian language and legalised. In the countries that have signed the Hague Convention for legalisation, the legalisation could be done by apostille instead of the Bulgarian Embassy.

The applicants are permitted to submit their documents for more than one programme at the same time and need to provide an order of preference. The assessment of the submitted admission documents is delivered by the administrative staff of the university.

There is an application fee of 15 Euros, credited to the account in EUR of the European Polytechnical University.

There is a rating system for the formation of groups at the university. Based on high school or university certificate achievements, the average grade shall be 4 while the grade in mathematics shall be 4 at minimum. The grades are given according to the grade scale valid in Bulgaria, where 2 means failed and 6 stands for excellent.

Due to the development strategy, explained by the university's rector, it is possible to increase/decrease the number of the teaching staff according to the varying number of currently enrolled students. This flexible strategy allows for quick reaction on the programme demand of the future university's students.

If students are enrolled at another university and will to continue their studies at EPU, special rules for crediting previous university achievements are applied. In case of transfer from another university, students need to present their academic transcripts including the names of courses they have studied, hours and ECTS credits of study of each course, grades and contents of the courses that have been studied. The transcript must have the original stamp of the previous university and it should be translated into Bulgarian.

In each individual case, the teaching staff member responsible for the delivery of the courses in the semesters that external students apply for assesses the submitted documents in parallel to the formal admission assessment provided by the administrative staff of the university. Should the competences provided at the previous university not comply with those expected at EPU in the targeted semester, additional courses may be offered to the students.

#### **5.4 Examination system**

The academic feasibility of the programmes is ensured by suitable curriculum designs in the three study programmes. The procedures of examination and testing are basically regulated in the “Regulations for the Conduction of Examination and Assessment of the Students and Graduates at the European Polytechnical University”, but they should be implemented in all study programmes with full consequence. Overall, the tests are module-related, more knowledge- and skill-oriented. Examination procedures are suitable in quantity, frequency, and variation. In the study programmes the students get a variety of different types of examinations. Continuous assessments are included in the curriculum. The final thesis and also the intermediate exams in “Civil Engineering” and “Earthquake Engineering” are reviewed by one internal reviewer from the faculty and an external reviewer. The external examiners are scholars who are independent from the primary course instructor of the discipline which they are evaluating. The external reviewers receive the exam or thesis anonymously along with information on the study material of the evaluated subject. External reviewers are recruited by the president of the university and they are remunerated with symbolic amount of 5 Leva (2 Euro) per exam.

The students will receive feedback on their final thesis, as well as on the exams and collected homework in the course of the study programme. Exams can be repeated three times within the scope of the tuition fees, additional exams in the same subject can be taken, for additional fee payment.

In order to improve the quality of the test, thesis and research work a general guideline for the students on how to conduct research and other academic work (referencing, literature work, etc.) must be introduced. Also template structures and editing guidelines for thesis shall be introduced to unify and to further improve the quality of the work delivered and to provide guidance to the students in this regard.

#### **5.5 Documentation and transparency**

The programmes seem to be well documented online and the university information system is currently upgraded to provide further and better access to the necessary resources. The necessary data for the admission process is transparent, well documented, and accessible to students and to the public. The same is true for regulations on exams and the recognition of competences according to the Lisbon Convention and the recognition of the professional competences.

Required legal documents such as final grade certificates, Transcripts of Records and Diploma Supplements are contained in the self-report on the study programmes. Concerning the implementation of the programmes, data on the workload of students are available.

## 5.6 Gender justice and compensation opportunities for disabled people

No worked out concept for gender justice has been presented by EPU, but there seem to be a fair number of woman in leadership positions on the university administration level. In the engineering disciplines assessed (Civil Engineering, Earthquake Engineering and Green Energetics) the share of women is far below the share of man among the teachers and as well concerning the students. This is however characteristic for the disciplines and not specific for EPU. A special programme to attract female students and staff has not been mentioned during the audit. Also the student admission process does not have separate quota for male and female students.

Students in special situations (e.g. with disabilities, or from disadvantaged economic circumstances) are mentioned in the self-assessment reports for the three study programmes. According to these reports, the university offers financial help to students from disadvantaged economic circumstances, as well as flexibility in the teaching activities for those students with permanent disabilities and lowered work capacity.

The new building, which is currently being built, is designed to meet all regulatory requirements to allow people with disabilities equal education.

## 5.7 Conclusion

The requirements for the successful operation of the study programmes (Civil Engineering, Earthquake Engineering and Green Energetics) are met. For the operation of the programmes sufficient personal resources as well as organisational and administrative framework, including a suitable examination system and the other essential organisation frameworks, are in place.

The staff base currently has a high average age and in future a younger faculty, with sustainable mix of good junior and experienced senior staff members, should be developed. The shortcoming in the own infrastructure for the scientific work and the engineering disciplines (due to the starting phase of the university) is currently overcome by collaboration with established institution and other external resources. This is appropriate for the starting phase of the university, but in future own facilities need to be build up in order to operate the programmes on the high quality level aspired.

## 6 Quality Management

The European Polytechnical University of Pernik has a detailed documented organisational framework of its quality management, which is based on the law of the Higher Education Act.

In the context of university management, the SEAQE (regulations on the structure and activity of the System of Evaluation and Assurance of the Quality of Education) is a subsystem carried out by its academic council. The regulation specifies accurately methods, procedures and functions concerning improvement and monitoring of the quality of education, data analysis, and incentives for encouraging and corrective actions depending on the evaluation's results.

The evaluation procedures are mainly based on a self-evaluation of the subject of assessment, containing a questionnaire student's get before and after the exam. The results are given to the lecturer and discussed within the programme council, who suggest corrective actions for improvement.

Furthermore, students are invited to the meeting of the programme council and the results are released in public, by what the students can overview the improvement of the lecturer. The questionnaire includes the teaching, expectations of the students, the content, and also student's suggestion to improve the lecture.

Depending on the measure by the system of evaluation and assurance of the education quality (SEAQE), on his scientific degree, and according to the rules of teaching and/or research work at the university, the regulation on calculation of the academic staff member determines the lecturer's salary. The lecturer's workload is defined by teaching and research work, which is supposed to be not less than 60 percent training activities and 30 percent research work.

Profitable for the study programmes is the university's intention augmenting international experience, relating to this students in the third year have the opportunity visiting Ulster for practical internships. In general the university promotes students doing their practical internships in foreign countries by suggesting companies. By including electronic education worldwide study materials and methods are usable, so that the intercultural competencies and fitness can be increased.

The curricula of EPU are influenced by recommendations and amendments e.g. of the chamber, which encourages the university's intention to cover the study programmes with important information on practical issues. With regard to this, the responsiveness of the university for the market demands is remarkable.

There are two ways of encouraging and promoting the quality management, moral and financial. The following pay period is influenced by the results of the quality assessment, information about the best instructors are published on the university's website as well as the rating results of all instructors.

With the regard to the quality management, the regulation for payment and financial incentives to students sets specific fee categories, depending on their educational qualification, the speciality, the country that the students is coming from and the GPA of the student he received previous academic year. All in all the quality management elaborated by the EPU is well-documented,

shows good availability and is referring to the educational development of a sufficiently covered policy strategy.

## 7 Summary

The programmes “Green Energetics” (B.Sc.), “Civil Engineering” (B.Sc.) and “Earthquake Engineering” (M.Sc.) have been assessed on the basis of the *“Standards and Guidelines for Quality Assurance in the European Higher Education Area” (ESG)*. The reviewers come to the conclusion that the standards 1.1 (Policy for quality assurance), 1.3 (Student-centred learning, teaching and assessment), 1.4 (Student admission, progression, recognition and certification), 1.5 (Teaching staff), 1.6 (Learning resources and student support), 1.7 (Information management), 1.8 (Public information), 1.9 (On-going monitoring and periodic review of programmes) and 1.10 (Cyclical external quality assurance) are fulfilled.

Criterion 1.2 (Design and approval of programmes) is only partly fulfilled for the study programmes “Green Energetics” (B.Sc.), “Civil Engineering” (B.Sc.) and “Earthquake Engineering” (M.Sc.), since a guideline for conducting scientific work, covering aspects e.g. of quotations, intellectual property, templates etc., addressing students of technical study programmes, is missing. Further, for the programme “Civil Engineering” (B.Sc.) contents in “Building Physics” are missing.

The programmes have been also assessed against the specific *German standards for the accreditation of study programmes („Regeln des Akkreditierungsrates für die Akkreditierung von Studiengängen und für die Systemakkreditierung“)*. The reviewers find that the criteria “Qualification Objectives of the Study Programme Concept” (criterion 1), “Academic Feasibility” (criterion 4), “Examination System” (criterion 5), “Programme-related Co-operations” (criterion 6), “Facilities” (criterion 7), “Transparency and Documentation” (criterion 8), “Quality Assurance and Further Development” (criterion 9) and “Gender Justice and Equal Opportunities” (criterion 11) are fulfilled.

Concerning criterion 3 (“Study Programme Concept”) the reviewers state a partly fulfilment, since a guideline for conducting scientific work, covering aspects e.g. of quotations, intellectual property, templates etc., addressing students of technical study programmes, is missing. Further, for the programme “Civil Engineering” (B.Sc.) contents in “Building Physics” are missing.

The criteria “Conceptual Integration of the Study Programme in the System of Studies” (criterion 2) and “Study Programmes with a Special Profile Demand” (criterion 10) do not apply.

## 8 Recommendation of the expert group

The group of experts recommends the following **decision**: Accreditation with conditions.

The group of experts proposes the following **conditions**:

### 8.1 General condition

- (1) The university has to develop a guideline for conducting scientific work, covering aspects e.g. of quotations, intellectual property, templates etc., addressing students of technical study programmes.

### 8.2 Condition for the study programme “Civil Engineering” (B.Sc.)

- (1) The content of the discipline “Building Physics” has to be updated and must comply with the agreements of the “European Standing Committee of Professors of Building Physics and Technical Building Services”.

## **IV Decision of the ACQUIN Accreditation Commission**

### **1 Decision**

Based on the evaluation report of the expert group, the statement of the Higher Education Institution and the statement of the Standing Expert Committee, on 7 December 2015 the Accreditation Commission of ACQUIN took the following decision:

**The study programmes are accredited with the following general and specific conditions:**

#### **General Condition**

- **The university has to develop a guideline for conducting scientific work, covering aspects e.g. of quotations, intellectual property, templates etc., addressing students of technical study programmes.**

For the further development of the study programme the following recommendations are given:

- As there is no specific regulation on how the students coming from other universities will be assessed and admitted to a programme, each partnership agreement with other universities shall include an annex comprising a standardised regulation based on the context-related requirements of the programme to be settled down by the teaching staff of the programme. This annex may be updated once there are changes in the teaching programme of the partner university.
- The examination system should be improved in regard to the practical organisation. Therefore, the "Regulations for the Conducting of Examinations and Assessment of the Students and Graduates at the European Polytechnical University" should be implemented in all programmes.

#### **Civil Engineering (B.Sc.)**

**The study programme „Civil Engineering“ (B.Sc.) is for the first time accredited with the following additional condition:**

- **The content of the discipline "Building Physics" has to be updated and must comply with the agreements of the "European Standing Committee of Professors of Building Physics and Technical Building Services".**

**The accreditation is valid until 31 March 2017.**

**After fulfilment of the conditions the study programme is accredited until 30 September 2021. The HEI has to submit the documents for the fulfilment of the conditions until 1 September 2016. In case of insufficient proof of fulfilment of the conditions the accreditation will not be extended.**

**After receiving a comment of the Higher Education Institution, the accreditation procedure can be suspended once for a period of not more than 18 months, if it can be expected that the HEI will remedy the defects within this period. A statement of the HEI requesting a suspension has to be submitted to ACQUIN by 22 January 2016.**

For the further development of the study programme the following recommendation is given:

- It is recommended to include a course in scientific/technical English into the curriculum.

### **Green Energetics (B.Sc.)**

**The study programme „Green Energetics“ (B.Sc.) is for the first time accredited without any further condition.**

**The accreditation is limited until 31 March 2017. In case of stating the fulfillment of conditions by the Accreditation Commission after submitting documents not later than 1 September 2016, the study programme will be accredited until 30 September 2021. The accreditation is not prolonged if there is no evidence for the fulfillment of conditions.**

**The accreditation procedure can be suspended by request of the HEI for up to 18 months, if there is the prospect that the HEI is able the correct deficits within this period. A statement of the HEI requesting a suspension has to be submitted to ACQUIN by 22 January 2016.**

For the further development of the study programme the following recommendations are given:

- The lab-facilities on site in Pernik do not show the state-of-the-art in research. The reviewers strongly recommend improving this with a rising number of students.
- Courses in “Thermal Engineering” and “Numerical Methods” should be added to the curriculum, at least as electives.
- Electives should cover courses in “Professional English”.
- The module handbook should be revised to correct some mistakes, such as wrong codes for the thesis or missing remarks on exams in some courses.

### **Earthquake Engineering (M.Sc.)**

**The study programme „Earthquake Engineering“ (M.Sc.) is for the first time accredited without any further condition.**

**The accreditation is limited until 31 March 2017. In case of stating the fulfilment of conditions by the Accreditation Commission after submitting documents not later than 1 September 2016, the study programme will be accredited until 30 September 2021. The accreditation is not prolonged if there is no evidence for the fulfilment of conditions.**

**The accreditation procedure can be suspended by request of the HEI for up to 18 months, if there is the prospect that the HEI is able to correct deficits within this period. A statement of the HEI requesting a suspension has to be submitted to ACQUIN by 22 January 2016.**

For the further development of the study programme the following recommendations are given:

- Given the importance of aseismic assessment and upgrading of existing cultural heritage buildings, consideration ought to be given to some additional teaching in the design and performance of masonry buildings.
- Curricula document should specify learning outcomes and expected competences more explicitly; recommended reading texts should be indicated.
- Improvement in laboratory facilities, in the availability of specialist literature, particularly journals, and of specialist modelling software, is recommended.

The Higher Education Institution has requested a new deadline for submitting documents that prove the fulfilment of the conditions.

Based on the statement of the expert group, on 28 March 2017 the Accreditation Commission took the following decision:

**The Higher Education Institution has to submit documents that proof the fulfilment of the conditions of the study programme “Civil Engineering” (B.Sc.) until 1<sup>st</sup> June 2017. The accreditation period is extended until 30 June 2017.**

**The Higher Education Institution has to submit documents that proof the fulfilment of the conditions of the study programme “Green Energetics” (B.Sc.) until 1<sup>st</sup> June 2017. The accreditation period is extended until 30 June 2017.**

**The Higher Education Institution has to submit documents that proof the fulfilment of the conditions of the study programme “Earthquake Engineering” (M.Sc.) until 1<sup>st</sup> June 2017. The accreditation period is extended until 30 June 2017.**

## **2 Fulfilment of conditions**

The Higher Education Institution has submitted the documents that prove the fulfilment of the conditions in due time. These documents have been forwarded to the Standing Expert Committee with request for examination. The Standing Expert Committee came to the conclusion that the conditions are fulfilled.

Based on the statement of the Standing Expert Committee, on 26 September 2017 the Accreditation Commission of ACQUIN took the following decisions:

**The conditions of the study programme “Civil Engineering” (B.Sc.) are fulfilled. The accreditation period is extended until 30 September 2020.**

**The conditions of the study programme “Green Energetics” (B.Sc.) are fulfilled. The accreditation period is extended until 30 September 2020.**

**The conditions of the study programme “Earthquake Engineering” (M.Sc.) are fulfilled. The accreditation period is extended until 30 September 2020.**