ACQUIN
Akkreditierungs-, Certifizierungs- und Qualitätssicherungs-Institut

Accreditation report

Accreditation procedure

European Polytechnical University (EPU) Pernik/Bulgaria

„Applied Computer Science" (B.Sc.)

I Procedure

Date of Contract: 12 August 2014

Receipt of self-evaluation report: 13 April 2015

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Standing Expert Committee: Informatics

Attendance by the ACQUIN Office: Dr. Stefan Handke

Decisions of the Accreditation Commission: 30 September 2015

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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 programme, 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 programme and university. The participation is perceived as very valuable not only for evaluating the programme, but also for a better understanding of the legal and socio-cultural background of the Bulgarian 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

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 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 from abroad 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 programme in its 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 programme "Applied Computer Science" (B.Sc.) is run by the department of Applied Computer Science and Communication Technologies. Other programmes at this department are the Master's programme "Computer Systems and Networks" and "Mobile Communications".

For EPU and the Applied Computer Science programme the practical education of modern skills and competence is important. A practical education shall be done in a real business environment; therefore, the university fosters the contact with business partners and receives advice from the Academic Council. The Academic Council consists of academic professors, representatives of employers, professional organisations and modern businesses. Among these representatives of Vivacom, IBM or Siemens are to mention.

III Evaluation

1 Targets of university and department

The targets of EPU are based on the need of motivated and highly qualified specialists with adequate realisation in the labour market and in science. The educational profile of EPU is compiled from technical sciences, computer science, social and economic sciences.

In addition, the following targets are formulated:

- Attracting foreign students, mainly of the regions Southeast Europe, Black Sea basin, Russia, Ukraine, Belarus, the Arab Countries and countries from Africa and Asia in order to react on the educational and economic problems in these regions and, on the other hand, to compensate the decreasing number of Bulgarian students due to the demographic crisis in Bulgaria and the ongoing brain drain.
- Implementing a good contact between the university and employers' organisations aimed at achieving higher education based on competences and being able to continuously improve the study programme and the teaching methods.
- Keeping the higher education free from political influence.
- Imparting competence in English language, which is indispensable in the modern technical globalised world.
- Accordance with European strategies.

To achieve all these aims, EPU employs highly experienced national professors as well as English speaking foreign teachers with good professional practices from prestigious European universities. In addition, EPU makes serious efforts to participate as a leading partner in national and international projects and initiatives.

2 Targets of the study programme

2.1 Short summary of the study programme

The study programme for "Applied Computer Science" (ACS) is developed in accordance with the programme "Europe 2020" of the European Union and is based on the recommendations of the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronics Engineers (IEEE). It is oriented at comparable programmes in leading European universities. The main targets of the programme for tuition in ACS are clearly defined. The university aims at building highly motivated and qualified specialists, satisfying the needs of society on a national and regional scale and providing opportunities for quick professional realisation on the labour market. The study programme ACS is aimed to provide the students with theoretical knowledge, practical

skills and professional competences, giving every student the possibility to develop his individual profile. The courses are exclusively held in English to attract foreign students and to prepare the students for the international business in Information Technology. The Bachelor's Degree in ACS is also aimed to give students the possibility to take part in a Master's programme in "Software Engineering" which will be established in the near future.

The target group consists of Bulgarian students and foreign students from the Balkan region, Asia and Africa with completed secondary education and certified English language proficiency. It is aimed to attract more foreign students in the future. In the long run, the university aims at enrolling 25 students each academic year. For the present year an enrolment of at least 15 new students is envisaged.

The study programme comprises eight semesters with 242 ECTS credits and is aimed to give a broad education in the basic fields of computer science grounded on a theoretical fundament. By the means of elective modules, which can be chosen beginning with the third semester, the students are capable to build an individual profile. In the sixth semester the students are doing practical work in an industrial company in the context of industrial placement. In Semester 7, students have the choice to focus on business oriented or scientifically oriented courses. This is only possible, if at least five students have the same interests. All the classes are held in English. The first semester is provided for teaching the English language. By means of a bonus system students always can control their progress in the study programme. In addition, by gaining bonus points they can reduce their study fees.

2.2 Objectives and competences

All central fields of modern computer science are included in the study programme of Applied Computer Science of EPU which comprises 8 semesters. This is much time in comparison to other Bachelor's study programmes comprising 6 or 7 semesters. With the aid of the elective modules, the study programme is flexible to integrate new disciplines and to react on dynamically changing situations in the field of information technology. An important part of the study is the sixth semester, which is proposed for industrial placement. This is a perfect possibility to gain professional experience. The programme is suited for the students to gain fundamental knowledge in computer science and to develop their personal skills in such a way that students are capable to enter the labour market immediately after graduation.

Competences for being a member of the international working society are procured by courses like „Introduction to the specialty" read by representatives of the industry, and "European values and culture" read by a foreign professor.

The study programme does not only consist of traditional lectures, but all kinds of modern teaching like laboratories, seminars, projects, self-study with the aid of web material, language training

is offered by an experienced teaching staff. A wide range of IT-technology is provided to meet the requirements of computer and internet technology of the present and the future.

2.3 Personal development and capability for civic engagement

The students of "Applied Computer Science" have the opportunity to develop a personality in many aspects: professional competence, practical experience, international contacts and research in outstanding environments. The study programme gives room for having a part time job outside the university. In the future, a campus will allow the students, to have contacts with students from other disciplines, and to form a multinational student society. In this ambience, the students at EPU have many opportunities for civic engagements.

2.4 Employability

The study programme "ACS" is aimed to provide the basic knowledge in addition to specialised knowledge for being prepared to get a job in the industry or in organisations. By means of the practical semester, projects in cooperation with partners from industry as well of the contacts of EPU with employers' organisations students will have very good chances to find a satisfying job immediately after graduation.

2.5 Conclusion

The targets of EPU and of the study programme "Applied Computer Science" are capable to offer higher education in the field of computer science in a high quality. The combination of theoretical and practical study subjects is ideal for preparing the students for professional careers in the international labour market. By teaching all courses in English, which is unique in Bulgaria, the study programme is attractive for the intended target group from foreign countries. The fact that at the moment the number of students is still very small, especially from foreign countries, is not due to the study programme, but is a result of governmental and administrative obstacles.

3 Concept of the study programme

3.1 Structure of the study programme

With a total number of 242 ECTS credits obtained in 8 semesters, the programme marginally exceeds the minimum requirement as defined by Bulgarian state law, which are 240 credits.

Aside from core computer science modules, the curriculum includes a small number of general education modules such as "European Values and Culture", "Basics of economics", "Social legal, and ethical aspects", and "Physics".

Regarding the core modules, the curriculum starts with basic introductory courses to Computer Science, a Programming course as well as foundational courses on Applied Mathematics, Physics, and Economics. The second semester continues the Programming track with a "Programming Language" module, focussing on imperative programming, a module "Internet Programming", and a standard "Algorithm and Data Structures" module. A course on "Computer Organization" gives a first glimpse at the architecture of von Neumann Computers, and the "Discrete Mathematics" module emphasises the basic mathematical skills particularly relevant for computer scientists. The following semesters serve to widen the horizon in Applied Computer Science, with required modules covering the essentials of Databases, Compilers, Operating Systems, Parallelism, Networks, Mobile Computing, Software Engineering, Human Computer Interfacing, Artificial Intelligence, Graphics, and Security, as well as some advanced topics in Software Engineering and Computer Architecture.

The only standard subjects that are not explicitly found in the curriculum are those usually subsumed under "Theoretical Computer Science". While themes such as automata theory and grammars certainly are touched in the module "Programming II/Programming Language Translation" subjects, such as (non-)computability, complexity, NP-completeness are not covered in detail. One may argue that in an "Applied Computer science" curriculum such subjects are less relevant, yet this may prove to be a bit short-sighted taking into account that a field developing and changing as rapidly as Computer Science needs basic theoretical skills enabling graduates to adapt and embrace new, yet unforeseen developments. This was a point strongly emphasised by the representative of a local software company who expressed his great interest and the general demand for solidly educated students in the field.

The peers agree with this analysis. They recommend enhancing students' competencies in mathematics or theoretical computer science through subjects relevant to the foundations of the field, such as logic, computability, and complexity. One way for achieving this could be to perhaps replace the Physics module, which did not appear to have a strong backing within the faculty anyway, and to replace it with a course on theoretical backgrounds of Computer Science or to spread the course on Discrete Math over two semesters, while extending it with appropriate content.

Whereas the contents of the first two semesters are essentially fixed, beginning in the third semester, the students will always have the choice of two electives out of three offered. Only if at least four students choose a particular elective, that one will be offered. The seventh semester additionally allows a specialisation worth two modules in either a Business or a Science oriented Track. This choice, however, is subject to enough students being interested in one of these tracks or the other.

The sixth semester is devoted to three months of practical work as an intern in a company. In the Curriculum Description this is listed as module "ACSB632 Industrial Placement", but it is not mentioned in the module handbook. The peers found it interesting to learn, for instance, that prior to the internship a precise to-do-list is agreed upon and monthly reports have to be written which are submitted to the ministry of education. Such information must be given in the module handbook, which should be updated accordingly. Another course description missing from the module catalogue was submitted after the peer's visit, and it is assumed that it will be part of the module handbook in the future.

The seventh semester includes a Project Course, which is meant to prepare self-study and research skills for the Bachelor thesis – often referred to by the traditional term "Diploma Thesis" - in the eighth semester. The students are given 2.5 months for their thesis, which counts for 12 credits.

Students report that the courses are offered at the right level, taking into account the level of their previous education. They report that beginning with the fourth semester, courses become tougher, which is to be expected. However, the peers stumbled across a few courses listed within the electives associated with higher semesters which appear to be rather elementary, in that they should be accessible to first or second-year students, such as e.g. *Scripting Programming* in Semester V or *Internet Programming* in Semester VII. Even though students reported that the electives associated with a particular semester could be taken out of order, often students take a succession as shown in a plan of study as obligatory. Therefore, moving such basic courses ahead might provide better advice to the students.

3.2 ECTS and modularisation

All courses are appropriately modularised, and the ECTS credits attached to the courses appear commensurable with the assumed average workload a student has to invest into it. The courses are documented in the module handbook (called "Academic Standard"). A few quirks in the module handbook ask for correction, as follows:

- A few module descriptions are missing. One was presented to the peers subsequent to the visit. The descriptions for the Project work (ACSB737) and for the Bachelor thesis (ASB845) are missing.
- The module handbook contains descriptions of courses which are not part of the official Academic Curriculum (e.g. "Advanced Topics in Software Engineering" ACS734 or "E-Business Technology" ACS 735, "Design of Software Systems" ACS207).

Apart from the above mentioned revisions, the module handbook needs a final editing focusing on grammatical mistakes. There are many passages which are not understandable due to poor grammar. Further, a few misspellings of proper names (e.g. "Erbran" resp. "Erbranov" should be "Herbrand") should be corrected.

3.3 Admission criteria and recognition of competences

Admission requirements for the study programme Bachelor of Applied Computer Science are a secondary (High School) degree with a grade point average (GPA) comparable to ECTS Grade "C", a grade of at least "C" in mathematics and command of English language at a level defined by either the TOEFL test (min. 70 points), SAT, ACT or IELTS (min. 5,5).

The latter two requirements may optionally be tested by the university. Furthermore, the university offers optional preparatory courses in mathematics and in English, running 3, 6 or 9 weeks, which may be taken by students dependent on their individual needs.

The university has regulations in place for transferring credits obtained in comparable modules at other universities. Based on the subject matter, a student is given a synopsis of skills expected for the modules he would like to transfer. An examination committee is formed which checks the expected knowledge and skills, if deemed necessary by way of a written exam. There is no explicit reference to the procedures set forth in the "Lisbon Convention", nevertheless do the recognition regulations at EPU conform with this convention. In the discussion with students they acknowledged that in individual cases competences achieved in their home country had been partly recognised.

In regard to the admission of international applicants it has to be pointed out that Bulgarian visa requirements for foreign students are often problematic and hamper them to study at EPU.

3.4 Teaching methods and study contexts

Teaching methods include lectures, supported by lab exercises, case studies, self-study and practical training obtained in a one-semester internship. There are no seminars, in which the students would be challenged to research literature, to present results, to speak in front of an auditory. The module "Project Work" (ACSB737) is meant to prepare students for the thesis and to prepare them for their thesis research. Apparently it is meant as a one-to-one tutoring from professor to student. Unfortunately that module is not explicated in the module handbook.

Exams are usually written exams which are also evaluated by an external grader. Other forms of examinations are only hinted at in the module handbook (the document "Academic Standards").

3.5 Conclusion

The curriculum gives students a broad background in Computer Science. Some theoretical concepts, which will be helpful to clarify the base of systems, methods and further developments, are recommended to be included into the curriculum. Elective courses not requiring much in terms of prerequisites should be available (and recommended) at earlier stages in the semester. The module handbook (the document "Academic Standards") should be proof read once more, completed

and titles and numbers of courses must be synchronised with those used in the "Curriculum description".

4 Implementation

4.1 Resources

4.1.1 Personal Resources

The teaching staff responsible for the core of computer science, that is for this Bachelor's programme and two related Master programmes, offered by the department, currently consists of 19 lecturers. Not all are employed full time by EPU. The peers were presented with the CVs of 6 professors fully or part time employed at EPU. A seventh one is due to join in September 2015. All of them hold PhDs in Computer Science, Mathematics or related fields and have been active in research. Some of them are employed at the same time at the Academy or at other universities in Sofia. They are assisted by professors from other departments, teaching subjects such as Business, English, Mathematics or Physics. Further professors affiliated with the department are full time professors from Sheffield, England, and from the University of Athens, who act as "Academic Partner" and plan to give CS lectures at EPU in the future, that is after retirement from their current institution.

This brings up a point raised in the discussion – namely that the average age of the academic staff is rather high, in all but two cases near or even beyond regular retirement age. Therefore, the university should make some effort to improve the ratio between experienced staff members and young academics. The university acknowledges this as a problem during the starting phase, but they list a number of reasons, why the situation is going to change in the future. One of them is that they believe EPU to be rather attractive for young academics on the ground that salaries are higher compared with state universities, and at the same time qualification requirements at EPU are higher. Applications are scrutinised by a committee and not just appointed by the president.

Students report that professors are always available and helpful – they can be contacted by email or during office hours.

During their internship, students are assigned mentors from their industrial host. These mentors are responsible for all issues that may arise and they oversee the tasks that are to be fulfilled during and after the internship.

There are two full time network administrators, one of them a recent graduate of the program, who at the same time is supposed to support students who are interested in studying a semester

abroad. Moreover, students and faculty have access during their courses and for research to a High Performance Parallel Computers System run by the Bulgarian Academy of Sciences.

While professors nominally are given the right to apply for a sabbatical after seven years, this possibility remains a theoretical one for many of the current teaching staff. For one, there will likely be age reasons. Furthermore, since many of the professors joined EPU within 2010/2011, they would be up for sabbatical roughly at the same time which, obviously, the university would not be able to grant. Therefore, the peers suggested that rather than a sabbatical year after seven years, the university should consider a sabbatical semester every seven semesters. This suggestion appears to find the approval of most professors.

4.1.2 Financial Resources

In the long run the university has to finance itself from the student fees. With a number of 25 beginning students each year this will be possible as far as computer science is concerned. Students will have to pay fees, and the fees are attractively scaled according to student performance. The basic fee of 750 Euros for students from EU countries and 1500 Euros for other students will have to be paid by those with grade point average (GPA) of "C". After the first year, the fees are calculated based on the GPA in the previous year. This may result in an additional 1/3 for poorer GPA performance or a bonus of 1/3 if the GPA is above "C". A GPA of "A" will allow for free tuition. This was seen by the peers as an attractive incentive system.

Regarding computer science, one has to consider that the department also creates revenues from the related Master programmes "Mobile Communications" and "Computer Systems and Networks".

Nevertheless, as far as the university is concerned, the largest group of students appear to study Architecture and related fields. The university as a whole has currently 464 students, with a goal of 2000, and a total number of 119 lecturers.

4.1.3 Infrastructural Resources

The peers were given the opportunity to visit some lecture rooms in the university's campus at Pernik (which is located some 35 km outside of Sofia) and some lab rooms available to EPU students in Sofia. The lecture rooms in Pernik are appropriately modern refurbished, but they are currently located in a building originally designed for a different purpose. This has the effect that the height of the rooms appears to be responsible for rather poor acoustics. The same building also hosts the labs, such as the robot lab, which the peers were able to inspect, and two computer rooms. The university has already concrete plans to build a campus in Pernik, neighbouring the current building.

EPU does have a small library, and additionally students have access to the libraries of the University in Sofia, including electronic access to many relevant journals, as shown via their web page.

4.2 Organisation, counselling and cooperation

Organisation

Responsibilities and contact of the individual programmes are clearly defined. The decision-making processes within EPU are well documented. First is the primary level: departments and their teachers – both full-time and tenured teachers. And second is the university level: the University Administration - the Rector and the Vice Rectors, the President 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. The Programme Boards of the Bachelor's programmes consists of at least seven members: four full-time tenured teachers from EPU who teach some of the disciplines included in the curriculum during the four years of education; one professor from a foreign partner university with experience in a related field; one representative of the business industry, a professional or creative organisation or another employer in the relevant professional field, and one student enrolled in the programme of study. The Programme Board makes decisions on curricula, qualifications profiles and descriptions of the courses includes in the programme curriculum, suggestions about new educators and finally reviewing the teaching material.

The chairperson of the Programme of Study is a tenured professor hired on a labour contract at the university with qualifications in the respective field of study and is appointed by the Academic Council following endorsement by the rector. The chairperson is responsible for organisational behaviour of the programme.

In general the administrative 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.

Cooperation

The Computer Science Department of EPU lists a number of cooperation partners. Partnerships mostly hinge on certain people such as the partnership with Sheffield University in England and Athens University. Professors from these institutions also teach, or intend to teach courses at EPU, and they are involved as academic advisors when setting up or updating the curriculum.

Cooperation exists in different ways. First of all there is some close cooperation between EPU and the Bulgarian Academy of Sciences to access the library and online databases. EPU is also well integrated in the education system of Bulgaria and the academic community.

EPU has a cooperative approach to networking with other HEIs, research institutes and representatives from business and administration. But there is no concept and regularity behind that, especially for the business sector.

EPU cooperates in applied computer science with academic partners and guest-lecturers. During the on-site visit, the main academic partners appeared to be members of the Bulgarian Academy of Sciences, who are heavily involved in EPU, as they form the core of the teaching staff.

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 many of the students at EPU come from abroad.

For students in need of tutoring, students from higher semesters are available to support students identified by teachers or guidance counsellors. The university's capacity to provide adequate varied support strategies promotes success for all students.

4.3 Examination system

A striking feature of EPU's examination system is that all exams are graded both by an EPU professor or lecturer and an external professor. For this sake exams are anonymized and sent to an external specialist who is paid a fixed fee per exam copy for grading. The grade for an individual module is obtained by a weighted average from the internal and external grade and may also involve components from labs, tests or midterms given in the course of the semester.

The procedure is well defined in the academic regulations, the composition for the weighted grade calculation is shown in each module description and procedures are defined handling cases where the distance between the internal grade and the external grade are apart by at least one grade point. The students had no complaints and judged the systems as fair and unbiased. This is, of course an important point since each student's GPA is closely connected to the tuition fee to be paid.

If more than three courses are failed in one semester, students are expelled**.** Otherwise, students can repeat the exams in these courses within the same semester. In case of failing in the same exam twice, a university commission decides whether a student can continue and has to repeat the entire course to write an exam a third time**.** Most of the students finish studies within the regular time of 8 semesters

As far as the quality of the exemplary exams are concerned, which the peers were given access to in the aftermath of the visit, there remain a few reservations that some exams might not appear

to fully reflect the intended learning outcomes as specified in the module handbook. In particular, several exams of otherwise technical nature consisted just of multiple choice questions, or of questions asking students to elaborate – essay style – on particular technical details. The peers had requested final exams, but the documents did not conclusively show whether the exams were final exams, midterms, part or whole of the module examination.

In summary, the peers agree that the examination system strives for a highest possible degree of fairness, while at the same time they hold that the exams should better reflect the learning outcomes and the use of just multiple choice (or similar) questions should be limited in favour of questions requiring students to demonstrate their acquired technical skills.

4.4 Documentation and transparency

The curriculum, the procedures and the facilities are well documented and very clearly documented via the university's web page. The same applies for data for the admission procedure, which are transparent 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 professional competences. Required legal documents such as final grade certificate, Transcript of Records and Diploma Supplement are contained in the self-report on the study programme.

Concerning the implementation of the programme, data on the workload of students is available.

4.5 Gender justice and compensation opportunities for disabled people

As it happens, the students in the programme, many of them coming from Africa (Nigeria, Tanzania, etc.) or from Turkey, are predominantly male. However, this is a matter of fact; the peer group did not find any sign of discrimination. In fact, both the teaching and the support staff include female members.

Although no concept concerning gender justice is provided by EPU, there appeared to be a fair number of women in leadership positions. The student admission process does not have separate quotas for males and for females. The university offers financial help to students coming from disadvantaged economic circumstances, as well as flexibility in the instructional activities for those students with permanent disabilities and lowered work capacity. Some of these accommodations include tutoring on an individualised curriculum and individualised time table, and testing outside of the regular final exam period.

Regarding accessibility, the lecture rooms as well as the labs and the sanitary facilities are easily accessible by wheelchair. All floors of the building are easy to reach via lifts and ramps. The new building, which is currently being built, is designed to meet all regulatory requirements so as to allow people with disabilities equal education.

4.6 Conclusion

The peers conclude that the implementation of the programme is satisfactory. The examination system is fair, even though exams could be made to better demonstrate the acquired skills. The teaching staff is appropriately qualified, but the university should intensify its efforts to rejuvenate its future staff and to improve the research environment by changing the sabbatical system so that a sabbatical is a realistic perspective for professors active in research.

5 Quality Management

The European Polytechnical University has established a quality management system which is well documented. The goal of the system is to oversee, maintain and govern the quality of education and the academic staff in the professional fields of study it offers. SEAQE (Regulations on the Structure and Activity of the System of Evaluation and Assurance of Quality of Education) is a fully developed policy instrument which covers the admission of undergraduate and graduate students, management of the learning process, examination and evaluation, student motivation, attestation and development of academic staff and their workload, calculation of staff compensation on the basis of the quality of their performance, etc.

The quality of education is ensured by two types of measures: incentives directed to the students and such directed to the lecturers. It is provided through the system of motivation of the teaching staff by accounting for the feedback information received from the students.

The university applies its uniform policy for financial stimulation of the quality of lecturers' work and the quality of students training assessed based on the results of their preparation. An incentive in the proposed organisation of the educational and research activity is the guaranteed freedom of teaching and research.

With regard to lecturers - their salary depends on the quality of their work quantified by 100-point training quality assessment and maintenance system. Defined are the requirements and rules, methods, order and scales for quality assessments are established. The main component in these assessments is the student feedback. Evaluators can also be future employers of the students. The volume of academic workload has two components: academic and research work with proportions defined - not less than 60 percent of educational and not less than 30 percent of the research workload. Thus any member of the academic staff is requested to teach and do science in the defined ratio.

With respect to the students, an innovative financial incentive is provided. For their training they pay taxes by which the university is supported because it does not use state subsidy. Depending on their result they pay a decreasing fee under a 4-point scale.

Lecturers are stimulated by the assessment they receive and the related benefits. In addition, opportunities for continuous improvement and maintenance of their qualification are provided. This is ensured by the annual planned courses related to the principles of adult training and aimed at developing skills for interactive teaching style, promoting the students motivation and new forms of presentation of material..

Finally, the quality management system is fully functional and it gathers all the relevant information including the real student workload through evaluation procedures and data analysis.

6 Summary

The study programme "Applied Computer Science" (B.Sc.) is a sound programme, which embodies current trends in databases, mobile computing or programming. It imparts knowledge on computer science, comprising professional skills and basic academic competences. The curricular concept of the programme is planned thoroughly and executed properly. Objectives are defined and can be reached with the proposed modular structure. Therefore, only some minor steps for a further development, e.g. a slight re-organisation of modules, are suggested by the reviewers.

The implementation of the study programme is based on an appropriate infrastructure, an efficient organisation and well-developed co-operations. The peers appreciate the co-operations, which EPU maintains with national and international companies in the region of Sofia.

Strong points noted by the self-report and mentioned during the on-site visit are that the university is located near the Bulgarian capital; the department is staffed with professors of high reputation in Bulgaria, and co-operations with Bulgarian authorities, such as the Bulgarian Academy of Sciences are active and tight.

All proposed steps for the improvement of the study programme can be evaluated by EPU itself, since a quality management system is established, which guarantees the further development of the study programme.

Even though the European Polytechnical University has been founded only five years ago, it has established experience in training young professionals from different countries in several subjects and in English, which is an innovative approach in Bulgaria. The group of reviewers believe that the programme at EPU is of good quality and has a unique character in the Bulgarian system of higher education.

IV Recommendation to the Accreditation Commission of ACQUIN

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

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

- The module handbook has to be updated to include descriptions for all modules which are part of the curriculum, synchronise the course names and numbers with those mentioned in the curriculum description.

V Decision of the ACQUIN Accreditation Commission

On the basis of the report of the expert group, the statement of the HEI and the statement of the standing expert committee, on 29 September 2015 the Accreditation Commission takes the following decision:

Der Bachelorstudiengang „Applied Computer Science" (B.Sc.) wird ohne Auflagen erstmalig akkreditiert.

Die Akkreditierung gilt bis 30. September 2020.

Für die Weiterentwicklung des Studienprogramms werden folgende Empfehlungen ausgesprochen:

- Competencies in Discrete Mathematics and basics of Theoretical Computer Science should be acquired in more than one course. Therefore, it is recommended to either add a course on Theoretical Computer Science covering material such as computability, logic and complexity, or spread the content of the module "Discrete Mathematics" over at least two modules in different semesters and augment it with the mentioned subjects.
- Elective courses in programming should be located at earlier stages in the curriculum. The department should allow more flexibility in the choice of elective courses within the period of the 2nd to 4th year.
- The university should make some effort to improve the ratio between experienced staff members and young academics.
- Exam questions should serve to better demonstrate the competencies acquired in a module, by giving multiple choice and purely descriptive questions a lower priority.

Die Akkreditierungskommission weicht in ihrer Akkreditierungsentscheidung in den folgenden Punkten von der gutachterlichen Bewertung ab:

Streichung von Auflagen

- The module handbook has to be updated to include descriptions for all modules which are part of the curriculum, synchronise the course names and numbers with those mentioned in the curriculum description.

Begründung:

Mit ihrer Stellungnahme legt die Hochschule überarbeitete Studiengangsunterlagen vor, die die beschriebenen Mängel behebt. Die Akkreditierungskommission folgt der Beschlussempfehlung des Fachausschusses.