ASIIN Accreditation Report

Bachelor and Master Degree Programmes
Informatics

offered by

Academy of Information Technology and Skills Łódź (Wyższa Szkoła Informatyki i Umiejętności w Łodzi - WSINF)

Last update: 28 March 2014

Basic information about the accreditation procedure

Degree programmes	**Bachelor and Master degree programme Informatics**
Higher Education Institution	**Academy of Information Technology and Skills Łódź (Wyższa Szkoła Informatyki i Umiejętności w Łodzi - WSINF)**
Seals applied for	The Higher Education Institution has applied for the ASIIN Seal for the degree programmes
Peer panel	Prof. Dr. Hans-Ulrich Bühler, Hochschule Fulda - University of Applied Sciences; Prof. Dr. Jürgen Ebert, University of Koblenz-Landau; Prof. Dr. Josef Meyer-Fujara, Fachhochschule Stralsund – University of Applied Sciences; Jürgen F. Schaldach, formerly T-Systems GEI GmbH
ASIIN Procedure Manager	Marleen Haase
On-site visit	The on-site visit took place on 23 and 24 October 2013.

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A Preliminary Remark

The on-site visit for the Bachelor and Master degree programme Informatics took place on 23 and 24 October 2013.

Prior to the talks with the representatives of the university, the peers met to prepare their questions and to discuss the self-assessment report. Professor Meyer-Fujara was asked to act as speaker of the audit team for the aforementioned degree programmes.

The peers had discussions with the following groups:

University management, responsible managers of degree programmes, teaching staff, students.

Additionally, the auditors inspected the infrastructure and the technical equipment at the Academy of Information Technology and Skills Łódź.

The following chapters relate to the Self Assessment Report (hereinafter SAR) provided by the Higher Education Institution (henceforth HEI) in June 2013 as well as to the discussions and information provided during the on-site visit including samples of exams and final theses.

The assessment and the award of the ASIIN-seal are always based on the European Standards and Guidelines (ESG) and the Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science valid at the time of conclusion of the contract.

The report has the following structure: Chapter B presents the facts which are necessary for the assessment of the requested seals. The information principally stems for the self-assessment report and related appendices provided by the HEI. An analysis and separate assessments of the peers about the compliance with the criteria for the requested seals follow. The assessment of the peers is preliminary and subject to changes based on the subsequent information. The statement of the HEI is included with the exact wording. The final recommendation of the peers is drafted after and based on the statement of the HEI (and additional documents, if applicable). The Technical Committee makes a proposal for the accreditation decision (chapter F). The final decision is taken by the Accreditation Commission for Degree Programmes (chapter G).

Any gender-specific terms used in this document apply to both women and men.

B Report of the peers (Accreditation Report)

B-1 Formal specifications

a) Name and awarded degree	b) Profile	d) Study mode	e) Programme Duration & Credit points	f) First & annual enrollment	g) Expected intake	h) Fees
Informatyka (Informatics) B.Eng.	n.a.	Full time Part time	7 semester (both full and part time) 210 ECTS CP	WS 1997 WS/SS	100 per year	full time: 4290zł (1026 Euro) per year part time: 3800zł (909 Euro) per year
Informatyka (Informatics) M.Eng.	Application-oriented	Full time Part time	3 semester 90 ECTS CP	WS 1997 WS	100 per year	full time: 4200zł (1005 euro) per year, part time: 3780zł (904 euro) per year

Analysis of the peers:

The peers realised that the English translation differs in the provided documentation and also on the homepage of the Higher Education Institution (HEI). The representatives of the HEI confirmed the name “Informatics” by awarding the degree Bachelor of Engineering and/or Master of Engineering. The auditors considered the names of the degree programmes as adequate to reflect the objectives and contents of the programmes.

Regarding the study mode the peers took note of the fact that the Bachelor as well as the Master degree programmes are offered as full and part time mode while having the same duration and awarding the same number of ECTS credit points. The assessment of the full time and part time mode will follow in the relevant chapters of the report.

The peers took into account that 100 students will be enrolled per year for each of the degree programmes. Based on statistics provided by the HEI a decline in the number of students can be discovered. This effect was confirmed by the Rector of the HEI by stating that Poland as such has to deal with the demographic change which is one of the reasons why the HEI is aspiring to open their offer to European, African, Arabic and Eastern Countries (see also chapter 5).

More than 60 percent of Bachelor's graduates continue with the Master. According to the information provided by the HEI about 25% are enrolled as full time students, about 75% as part time students.

Assessment of the peers:

Criterion 1 Formal specifications

The peers confirm that the characteristics of the degree programmes are documented.

B-2 Degree Programme: content concept & implementation

B-2-1 Objectives of the degree programme

B-2-2 Learning outcomes of the programme

As **objectives of the degree programmes** the institution states the following:

The objectives of the Bachelor degree programme (I cycle) are:

- to obtain general IT knowledge, basic engineering knowledge and to enhance the graduate's knowledge in the field of applying computer technology in various branches;
- to gain the skills of finding solutions for simple engineering tasks related to IT course;
- to prepare the graduate to work individually or in a team in the system and computer network manufacturing as well as in the companies focussing on the maintenance, system and computer networks implementation;
- to build up the awareness of other aspects of engineering activity and following the health and safety regulations and engineering ethics;
- to prepare the graduate to continue his education at the Master degree programme and to further his self-education.

Generally speaking, the Bachelor degree graduates have basic knowledge and the abilities required to understand the issues concerning algorithms, computational complexity etc. Graduates have in-depth knowledge of the advantages and disadvantages of modern computer science solutions.

They are able to choose the right tools either to isolate or to solve the problems occurring in the computer science infrastructure and they confidently operate the tools chosen for particular actions. The course includes the matters concerning social, vocational and safety problems in computer science and ergonomics.

The graduates of the studies have the knowledge of a foreign language at the B2 level according to the Common European Framework and they possess the ability to use technical language which is course-oriented. The graduates gain knowledge and skills compliant with their individual interests.

The last three semesters are devoted to one of the specialisations: programming and databases, computer graphics, and teleinformatics.

Programming and Databases

The graduates of these specialties are mainly programmers and programming projects managers. They have programming skills of commonly applied structural and objective environments including network, visual, system and low-level programming. They possess the knowledge of how to use and administrate databases. They can integrate various computer systems taking into account individual and commonly applied solutions.

Computer Graphics

Within the specialty named Artistic Computer Graphics students have a chance to gain the knowledge in the field of designing widely known and applied graphics. It includes the issues connected with advertising, information, presentation and interest-oriented graphics. What is more, students get acquainted with the DTP basics, digital printing and they are given the chance to learn to design visually attractive internet applications. The specialty offers theoretical fundamentals referring to graphical compositions as well as focuses on the aesthetics. Students are prepared to work individually and in team in the advertising agencies or in the companies offering internet, computer editing services etc. The profile of the specialty „Artistic Computer Graphics“ strengthens the position of the student in the company. The graduate of this specialty possesses a broad knowledge in the field and his skills are more attractive for the labour market.

Teleinformatics

Teleinformatics is a field which mainly focuses on the widely known information transfer problems (information and data). Teleinformatics closely connects two disciplines telecommunication – information transfer and computer science – information processing. The graduate of the specialty is prepared to work in telecommunication in the field of packet switching as well as in the field of information processing jobs such as data collec-

tion and storage (knowledge base and databases), programming for compression purposes and data transfer at different levels of security. What is more, the graduate possess sufficient skills to work in the sphere of processing and complex data analysis of real and compressed data so as to gain all required information and prepare visual and multimedia presentation of data processing results, organisation and implementation of the internet resources.

The main objectives of the educational process of the Master degree programme (II cycle) are

- to enable the graduates to gain a well-grounded knowledge of Computer Science with its theoretical fundamentals
- depending on the specialisation: to prepare graduates to develop and implement their knowledge multimedia technologies in various disciplines, advanced programming systems, computer systems, information systems, computer networks, advanced databases and internet applications and services.

On completion of the degree programme students are able to continue their education at higher levels.

As **intended learning outcomes of the degree programmes** the institution states the following:

The learning outcomes are described referring to the scope of knowledge, skills and social competencies and in accordance with the act of Higher Education Regulations which were implemented in the academic year 2012/2013. For this reason several tables are provided for both the Bachelor and Master programme.

For the Bachelor programme the following is provided with the self-assessment report:

- I. Basic information
- II. Expected learning outcomes for the course of computer science
- III. Table of references between the learning outcomes defined for the programme and the learning outcomes defined for educational disciplines and course profile (here: technical disciplines with reference to engineer competences)
- III. Table of reference between the learning outcomes defined for educational fields (here: in the field of technical sciences) and course profile and the learning outcomes defined for the curriculum
- IV. Table of reference between the learning outcomes defined for the field of education and course profiles leading to the acquisition of the required engineer competences

For the Master programme the following is provided with the self-assessment report:

- I. Basic information
- II. Expected, detailed learning outcomes for the course of computer science
- III. Table of references between the learning outcomes defined for the programme and the learning outcomes defined for educational disciplines and course profile (here: technical disciplines with reference to engineer competences)
- IV. Table of reference between the learning outcomes defined for educational fields (here only in the field of achieved engineering competences) and course profile and the learning outcomes defined for the curriculum
- V. Table of reference between the learning outcomes defined for the field of education and course profiles leading to obtaining engineer competences

The intended learning outcomes are not yet published.

Analysis of the peers:

The peers considered the *objectives* of the Bachelor and the Master programme basically as adequate. However, as the Master programme offers several specialisations the peers wondered why these are not reflected in the objectives. They recognized that the objectives described on the internet do specify the objectives according to the specialisation. In order to come to a final assessment the peers ask the HEI to provide the programme objectives of the Bachelor and Master programme differentiated by the specialisation for both programmes. Nevertheless, the peers learned that only three out of the six specialisations for the Master programme are in fact offered. Therefore, they decided only to assess the actual specialisations. (see also chapter 2.6 Curriculum)

The peers took note of the numerous tables stipulating the *learning outcomes* of the degree programmes as a whole as defined by the HEI (e.g. K_W01, K_W02, K_U01, K_K01, etc.) and its references to the learning outcomes as defined by the ministerial standards which both are according to the peers very much described and/or predefined in detail.

Looking into the details of the HEI's intended learning outcomes of the Bachelor programme the peers find for example in K_W05 (classified as knowledge) the following:

"Has a systematic, well-grounded theoretical knowledge of algorithms and data structures, their complexity, operating systems, network technologies, languages and programming paradigms, computer graphics, multimedia, human-computer interaction, A.I., databases, software engineering, embedded systems and security of IT systems. The graduate is also aware of the latest trends in the development of IT and computer science." (K_W05)

The peers support the intended learning outcomes as described by the HEI based on the information given so far. They even analyse them as ambitious ("well-grounded") and will assess to what degree it will be achieved in the chapter on the curriculum.

Looking into the given details of the intended learning outcomes of the Master programme, the peers refer for example to the learning outcomes K_U10 and K_U11 (both classified as skills) which are defined as follows:

"Is able to formulate and solve a simple problem using research methods of analysis, simulations and experiments." (K_U10)

"Can use properly chosen methods and techniques to solve complex engineering tasks and simple problems of research in the field of computer science. He can see the limitations of the existing tools." (K_U11)

Based on the example as well as the other described learning outcomes of the Master programme, the peers detect a strong emphasis on the practical solution of engineering problems (instead of an application-oriented approach). The learning outcomes, though, refer less to the scientific and research (methodological) competences a graduate should achieve at the academic level of a Master programme.

Finally, the peers got the impression that the learning outcomes are not yet available for stakeholders (i.e. students, industry representatives, etc.).

Assessment of the peers:

Criterion 2.1 Objectives of the degree programme

The HEI has appropriately classified both programmes in academic terms by allocating them to a level within the European Qualifications Framework.

Criterion 2.2 Learning outcomes of the programme

The peers came to the conclusion that the intended learning outcomes for both programmes as a whole have been specified in a very detailed manner. Therefore, the peers consider it necessary that the HEI's learning outcomes will be summarised and made accessible to the relevant stakeholders, particularly lecturers and students, in a way that students are able to appeal to them for example in the scope of the internal quality assurance system.

The peers basically are of the opinion that the learning outcomes for the Bachelor programme reflect the qualification level of the academic qualification awarded for the programme. They also see that the learning outcomes reflect the orientation framework for

the subject (here: Informatics) concerned as described in the ASIIN Subject-Specific Criteria for Informatics programmes.

For the Master programme the auditors found the Ministerial standards in terms of the generic engineering competences of the programme and with regard to the overall level of competences associated with the academic qualification adequate. However, the learning outcomes described by the HEI does not seem to fully reflect the orientation framework for the subject (here: Informatics) concerned as described in the ASIIN Subject-Specific Criteria for Informatics programmes. In particular, regarding the methodological competences, the peers seriously doubt that the described learning outcomes reflect in a proper way the requirements of the ASIIN Subject-Specific Criteria which states that graduates "can make contributions to the further development of informatics as a scientific discipline".

To what extent the learning outcomes of the HEI are in fact achieved is discussed in chapter 2.6.

According to the statement of the HEI relevant stakeholders were involved in the formulation of the learning outcomes.

The name of the programme reflects the intended learning outcomes and also the linguistic focus of the programme.

B-2-3 Learning outcomes of the modules/module objectives

The **objectives of the modules** (by the HEI throughout the self-assessment report so-called "subjects") are described in a module handbook, by the HEI so-called "syllabus". The description for each subject includes the following information: subject leader, name of the subject, mode of study, type of subject, number of hours, ECTS, learning outcomes, assessment of learning outcomes. For a number of subjects of the curriculum, the description is missing in the syllabus.

Analysis of the peers:

For this criterion, the peers also referred to the numerous tables stipulating the *learning outcomes* of the degree programmes as a whole as defined by the HEI (e.g. K_W01, K_W02, K_U01, K_K01, etc.) and their references to the learning outcomes as defined by the ministerial standards which - according to the peers - are both described and/or predefined in a very detailed manner.

The peers found out that the list of learning outcomes defined by the Ministry differentiates learning outcomes for the field of technical sciences (e.g. T1A_W01, T1A_W02, T1A_W03, etc.) and learning outcomes of achieved engineering competence (e.g. InzA_W01, InzA_W02, InzA_W03, etc.). For the Bachelor programme, table IV and V take into account the differentiation of the Ministry, whereas this is not the case for the Master programme. Both tables (IV and V) for the Master only refer to the achieved engineering competences but not to the learning outcomes for the field of technical sciences (as done for the Bachelor programme).

The peers faced difficulties to understand the tables and the relation of the learning outcomes of each of the module (by the HEI so-called "subject") to the overall learning outcomes. For a final assessment the peers therefore asked the HEI to provide the missing information (i.e. the reference of the learning outcomes for the field of technical sciences to the learning outcomes of the programme for the Master programme).

The peers clarified first of all the specific terms the HEI used. They understood that a module is a kind of "container" of subjects which are described separately in a so-called syllabus (i.e. set of module descriptions). A specialty is also called module and consists of several subjects.

The descriptions for the so-called subjects (i.e. modules) for both the Bachelor and Master programme were not provided as a complete set, i.e. a number of descriptions are missing. In order to come to a final decision on the learning outcomes and all other aspects of the so-called subjects (i.e. modules) the peers asked the HEI to provide the complete set of descriptions for both degree programmes including all relevant aspects.

The peers had difficulties to understand comprehensively the allocation of the overall learning outcomes of the programme to each subject (i.e. module). This is due to the detailed and comprehensive list of learning outcomes for the programme as a whole which is then codified with numbers which consequently are referenced in each description. Again, as the descriptions are not complete a final decision is still pending.

In the discussion with the students the peers learned that the module descriptions (i.e. description of the subjects) are only available to students if they are enrolled in the programme. In other words other stakeholders such as industry representatives or prospective students do not have access to this information.

Assessment of the peers:

Criterion 2.3 Learning outcomes of the modules/module objectives

The peers came to the conclusion – based on the available descriptions and subject to the provision of the complete set of descriptions – that they stipulate what knowledge, abilities and competences students are expected to acquire in the individual courses. With reference to the provided descriptions the peers confirm that the described overall learning outcomes are referenced in the individual courses of the programmes.

The subjects are described separately and are available for enrolled students. However, the peers refer to the requirements of the criterion 2.3 that specify that these descriptions have to be available for all relevant stakeholders – particularly students and lecturers – for consultation, and have to provide a basis for the further development of the modules.

The intended learning outcomes and the prerequisites for achieving them are clearly understandable to students.

B-2-4 Job market perspectives and practical relevance

The HEI mentions the following **job perspectives** for the graduates:

Labour market demand for IT specialists has a constant growing tendency particularly if it is referred to the telecommunication and network solutions applied by the leading and dominating companies which focus on VR implementation and „cloud computing“.

An integral part of the HEI is the Professional Development Office (BAZa) which provides instant communication between the student, the HEI and the employer. The operational tasks can be described by 4 areas:

1. The organisation, supervision and research of the effectiveness of student apprenticeships,
2. the organisation of the workshops, building student’s career path,
3. the assistance during the process of entering the labour market by the student and the graduate,
4. the surpervision and monitoring graduates’ career path (obligatory requirement since 2012 resulting from the act „Law and Higher Education”)

BAZa also supports students to find a part-time employment in the course of their studies. Within the structures of BAZa there is also the Employment Agency. It mainly focuses on the graduates and students of the HEI and takes into account the specialties and skills gained by the students during their studies.

In order to liaise with the local industry the HEI cooperates with the Businessman Council which consists of the local business representatives supporting the HEI in the process of

adjusting the educational offer to the labour market demand. Furthermore, the HEI cooperates in wide range of sectors with e.g. the Business Centre Club (BCC). The HEI has had its own Student BCC Forum since 2010 whose purpose is to promote economic activities and the assistance in setting up and developing private businesses.

Practical relevance of the programmes shall be achieved by an internship of four weeks and the topics of the final thesis. The topics of the Bachelor theses are related to the labour market demand and posses practical character. The topics of Master theses correlate to the current needs of the labour market and provide students theoretical analysis combined with the practical solutions and implementations. Moreover, the enrichment of the students' practical knowledge takes place in the course of the chosen specialty. The internship is directly connected with the syllabus which is realized in accordance with methodological and vocation-oriented subjects. BAZa can prepare the documentation, at the student's request, entitling the student to do internship abroad and issued in a foreign language.

Analysis of the peers:

The peers learned that the Businessman Council is a result of an EU project that consists of 60 representatives that meet once a semester. The representatives are from the HEI and employers. They come together in workshops or informal meetings in order to present and discuss their needs. The HEI describes these workshops as very successful as both partners do benefit from these meetings. According to the HEI they first meet once all together in one group and then discuss in smaller groups. These meetings also function as a source for new academic teachers.

The task of the BAZa is to support students to find an appropriate place for their internship. It differs from the Employment Agency mentioned as its main task is to support graduates to find an appropriate job.

The internships of four weeks are also based on the ministerial regulation. The internship is coordinated and supervised by a teacher. The internship in the part time mode may be recognised if the employment of the students fulfils the requirements for the internship or they can complete it at their company.

The students expressed their satisfaction with BAZa and the HEI's support to find an appropriate internship during their studies and a job after graduation. The peers also positively recognise the support of BAZa as well as the consideration of the demand of the labour market.

Assessment of the peers:

Criterion 2.4 Job market perspectives and practical relevance

There is a demand on the labour market for graduates who possess the intended learning outcomes (competences). The competences as presented allow graduates to work in a sphere appropriate to the qualification.

Basically, the training offered is linked to professional practice.

B-2-5 Admissions and entry requirements

According to the self-assessment report the admission and entry requirements are as follows:

Admission to the Bachelor degree programmes may be granted to all applicants who have completed their secondary school education with the "maturity" exam (or with an adequate, officially recognized foreign certificate).

Admission to the Master degree programmes may be granted to graduates who hold a bachelor's or an engineer's diploma.

Rules for the recognition of external study attainments/achievements are stipulated in § 21 (5) of Rules of Studies:

The rules for exempting a student from participation in certain classes, is also binding for students who obtained credits for a similar subject at another course, or at another university both in and outside of the Republic of Poland.

Analysis of the peers:

The auditors and the representatives of the HEI discuss the impact of the presented admission requirements and procedure on the quality level of the study programmes. The peers comprehend that applicants for the Bachelor programme that have completed secondary school ("Matura") are eligible for application. If more apply for the programmes than places can be offered, the HEI states, on the one hand, that best applicants will be selected based on the number of points allocated to certain modules such as mathematics. On the other hand, the peers understood that each applicant has to be offered a place.

As far as the Master programme is concerned the peers are surprised that graduates from every Bachelor programme are eligible to be admitted to the programme irrespective of the subject they have graduated in. The peers learned that in Poland the Bachelor's de-

gree in engineering takes seven semesters and all others six semesters. Only Bachelor's graduates with an engineering degree are eligible to be awarded a Master's degree in Engineering after having completed the Master. Taking into account that Bachelor graduates from every subject can be enrolled in the Master programme which has an engineering focus the peers wondered how it is guaranteed that the applicant is capable to achieve the learning outcomes given the specialisations and its prerequisites.

Assessment of the peers:

Criterion 2.5 Admission and entry requirements

The auditors find the admission requirements as presented during the visit for the Bachelor programme sufficient. However, it was not clear if every applicant has to be enrolled or if there is some kind of selection procedure if the capacity is exceeded. The peers were not provided any regulation on the procedures for admission to the programme. They consider it necessary to publish the regulations of the procedures and quality criteria for the admission in a way that prospective students can find them easily.

The peers assume that the educational aims for the Master programme can only be reached if the admission procedure assures adequate entry requirements in terms of the level as well as the subject chosen in the Bachelor degree. Regarding the academic level the peers confirmed the described procedure as adequate. Though, with regard to the described access requirements they have strong concerns whether the subject-related academic level can be achieved taking into account the regulations as referred to in the discussions. The admission requirements, however, must ensure that all students entering the programme have sufficient subject-specific qualifications at a comparable entrance level. The subject-specific qualifications of Bachelor graduates are not taken into account when deciding about the admission into the Master programme. The peers came to the conclusion that the HEI cannot guarantee that students admitted possess the required subject-specific competences to achieve in any case the intended learning outcomes.

Regulations are in place covering the recognition of activities completed externally that ensure that the learning outcomes are achieved at the intended level.

B-2-6 Curriculum/content

Bachelor Informatics – basic curriculum (modules I – IV) – full time mode

valid since academic year 2011/2012

Lp.	Nazwa przedmiotu	Eaxm after sem.	Hours						ECTS
			MIN-IMA	Total	including				
					Lecture	Tutorials	Laboratory	Seminar	
I	**Module of Core Subjects**								
1	English Language		120	120		120			5
2	Physical Education		60	60		60			2
3	Mathematical analysis	4	45	45	30	15			6
4	Linear algebra			45	30	15			6
5	Probabilistic Methods and Statistics	6	60	60	30	30			8
6	Discrete mathematics	3	60	60	30	30			7
7	Physics	3	45	60	30	30			6
8	Basics of electronics		45	45	30		15		3
9	Measurement and electrical engineering			30	15		15		3
10	Numerical methods	4		60	30		30		3
11	Computer systems archtecture	1		60	30		30		6
12	Practical Applications of Knowledge			30	0		30		3
13	Basics of computer science	1		90	30		60		6
14	Algorithms and computational complexity	2		75	30		45		8
15	Basics of programming	1		75	30		45		8
16	Programming paradigms	4		60	30		30		6
17	Applications Software			60	15		45		5
18	Programming languages	2		60	30		30		6
19	Operating systems	2		60	30		30		5
20	Operating systems administration			60	15		45		6
21	Network technologies	5		75	30		45		6
22	Computer graphics and human-computer communication	1		60	30		30		6
23	Artificial intelligence			60	30		30		6
24	Databases	3		75	30		45		6
25	Software engineering	4		60	30		30		3
26	Embedded systems			30	30		0		2
	Total		**435**	**1575**	**645**	**300**	**630**	**0**	**137**
II	**Module of Subjects Expanding Education**								
1	Professional and social problems of informatics			30	30		0		1

2	Ergonomics and Health Protection			30	30		0		2
3	Humanities*- elective subject		60	60	60				4
4	Philosophical concepts of a human being								
	Health Promotion								
	Manager of the new generation - effective management of the company								
	Genealogy of contemporary art								
	Techniques of data archivisation and data protection								
	Total		**60**	**120**	**120**	**0**	**0**	**0**	**7**
III	**Module of Training Programme**								
1	Summer training programme - 4 weeks after IV semester								2
2	**Total**		**0**	**0**	**0**	**0**	**0**	**0**	**2**
IV	**Module of Diploma Thesis**								
1	Diploma seminar			45	0			45	2
2	Bachelor/ Engineer thesis								**15**
	Total		**0**	**45**	**0**	**0**	**0**	**45**	**17**
total of all subjects		**16**		**1740**	**765**	**300**	**630**	**45**	**163**
including elective subjects									**20**

Module V (specialisation): COMPUTER GRAPHICS – full time

No.	Subject	Exam after semester	Teaching Hours					ECTS
			Total	including				
				Lecture	Tutorials	Laboratory	Seminar	
1	Computer Graphics	**5**	75	30		45		6
2	Programming project		60	0		60		4
3	Telecommunications and data transmission	**5**	60	30		30		5
4	Streaming media		60	30		30		4
5	Advanced computer graphics		45	15		30		4
6	Web game programming		45	15		30		4
7	Designing user interfaces	**6**	45	15		30		5
8	Multimedia technology	**6**	75	30		45		5

9	Designing of Graphics services	**7**	60	30		30		5
10	Computer aided design	**7**	60	30		30		5
Total of specialist subjects		**6**	**585**	**225**	**0**	**360**	**0**	**47**
Total of core subjects		***16***	***1740***	***765***	***300***	***630***	***45***	***163***
Total of major subjects			**2325**	**990**	**300**	**990**	**45**	**210**
Number of examinations:		**22**	+ diploma exam					

Module VI (specialisation): PROGRAMMING AND DATABASES – full time

No.	**Subject**	**exam after semester**	**Teaching hours**					**ECTS**
			total	**including**				
				Lecture	**Tutorials**	**Laboratory**	**Seminar**	
1	Computer-Aided methods of optimalisation	**5**	60	30		30		3
2	Programming project		60	0		60		4
3	File servers		60	15		45		4
4	Information exchange systems of management	**5**	60	30		30		4
5	Network bussines systems	**6**	60	30		30		4
6	Designing user interfaces		45	15		30		5
7	Low – Level Programming		60	30		30		4
8	Techniques of data archivisation and data protection		30	30		0		4
9	Genetic algorithms and artificial neural networks	**6**	60	30		30		5
10	Distributed processing	**7**	60	30		30		5
11	Programming of mobile devices	**7**	60	30		30		5
Total of specialist subjects		**6**	**615**	**270**	**0**	**345**	**0**	**47**
Total of core subjects		***16***	***1740***	***765***	***300***	***630***	***45***	***163***
Total of major subjects			**2355**	**1035**	**300**	**975**	**45**	**210**
Number of examinations		**22**	+ diploma exam					

Module VII (specialisation): TELEINFORMATICS – full time

No.	Subject	Exam after semester	Number of Teaching Hours					ECTS
			Total	Including				
				Lecture	Tutorials	Laboratory	Seminar	
1	Computer-Aided methods of optimalisation	**5**	60	30		30		3
2	Programming project		60	0		60		4
3	Telecommunications and data transmission	**5**	60	30		30		5
4	Streaming media		60	30		30		4
5	Computer networks	**6**	75	15		60		4
6	Fibre-Optical technologies		30	30		0		3
7	Genetic algorithms and artificial neural networks	**6**	60	30		30		5
8	Techniques of data archivisation and data protection		30	30		0		4
9	Computer systems security		75	30		45		5
10	Programming of mobile devices	**7**	60	30		30		5
11	Wireless systems of teletransmission	**7**	45	15		30		5
Total of specialist subjects		**6**	**615**	**270**	**0**	**345**	**0**	**47**
Total of core subjects		***16***	***1740***	***765***	***300***	***630***	***45***	***163***
Total of major subjects			**2355**	**1035**	**300**	**975**	**45**	**210**
Number of examinations:		**22**	+ diploma exam					

Bachelor Informatics – basic curriculum (modules I – IV) – part time mode

valid since academic year 2012/2013

Lp.	Subject	exam	Number of Hours						ECTS
			required minimum	total	including				
					lecture	tutorials	Laboratory	Seminar	
I	**Module of Core Subjects**								
1	English language		72	72	0	72			5
2	Mathematical analysis	**4**	45	27	18	9			6
3	Linear alebra			18	9	9			6
4	Probabilistic Methods and Statistics	**6**	60	60	27	33			8
5	Discrete mathematics	**4**	60	60	27	33			9
6	Physics	**3**	45	45	27	18			8
7	Basics of electronics		45	27	18		9		3
8	Measurement and electrical engineering			18	9		9		3
9	Numerical methods	**5**		27	18		9		3
10	Computer systems architecture	**1**		27	18		9		6
11	Practical Applications of Knowledge			18	0		18		3
12	Basics of computer science	**1**		54	18		36		6
13	Algorithms and computational complexity	**2**		36	18		18		8
14	Basics of programming	**1**		36	18		18		8
15	Programming paradigms	**4**		36	18		18		6
16	Applications Software			27	9		18		5
17	Programming languages	**2**		45	18		27		6
18	Operating systems	**2**		45	18		27		6
19	Operating systems administration			36	18		18		6
20	Network technologies	**5**		54	18		36		6
21	Computer graphics and human-computer communication	**1**		45	18		27		6
22	Artificial intelligence			36	18		18		6
23	Databases	**3**		54	18		36		6
24	Software engineering	**4**		36	18		18		3
25	Embedded systems			27	18		9		2
	TOTAL		**327**	**966**	**414**	**174**	**378**	**0**	**140**
II	**MODULE OF Subjects EXPANDING EDUCATION**								
1	Professional and social problems of informatics			18	18		0		1
2	Ergonomics and Health protection			18	18		0		2
3	Humanities*- elective subjects		36	36	36	0			4
4	Philosophical concepts of human being								

	Health Promotion								
	Manager of the new generation - effective management of the company								
	Genealogy of contemporary art								
	Techniques of data archivisation and data protection								
	TOTAL		**36**	**72**	**72**	**0**	**0**	**0**	**7**
III	**Module of Training Programme**								
1	Summer training programme - 4 weeks after IV semester								2
2	**TOTAL**		**0**	**0**	**0**	**0**	**0**	**0**	**2**
IV	**Module of Diploma thesis**								
1	Diploma seminar			18	0			18	1
2	Bachelor/ Engineer thesis								**15**
	TOTAL		**0**	**18**	**0**	**0**	**0**	**18**	**16**
Total of all subjects		**16**		**1056**	**486**	**174**	**378**	**18**	**165**
including elective subjects									**20**

Module V (specialisation): COMPUTER GRAPHICS – part time

No.	Subject	Form of credits	Teaching hours total	including lectures	tutorials	laboratory	seminar	ECTS
1	Computer Graphics	**5**	45	18		27		4
2	Prgramming project		36	0		36		4
3	Telecomunications and Data Transmission	**5**	36	18		18		5
4	Streaming media		36	18		18		4
5	Advanced Computer Graphics		27	9		18		4
6	Web game programming		27	9		18		4
7	Designing user interfaces	**6**	27	9		18		5
8	Multimedia technology	**6**	36	18		18		4
9	Designing of Graphics services	**7**	36	18		18		6
10	Computer Aided Design	**7**	36	18		18		5
Total of specialist subjects		**6**	**342**	**135**	**0**	**207**	**0**	**45**

Total of core subjects	***16***	***1056***	***486***	***174***	***378***	***18***	***165***
Total of major subjects		**1398**	**621**	**174**	**585**	**18**	**210**
Number of exams	**22**	+ diploma exam					

Module VI (specialisation): PROGRAMMING AND DATABASES – part time

No.	Subject	form of credit	Teaching hours total	including lecture	including tutorials	including laboratory	including seminar	ECTS
1	Computer-Aided methods of optimalisation	**6**	27	18		9		3
2	Programming project		36	0		36		4
3	File servers		36	9		27		5
4	Information exchange systems for management	**5**	36	18		18		4
5	Network bussines systems	**6**	36	18		18		5
6	Designing user interfaces		27	9		18		5
7	Low-level programming		36	18		18		4
8	Techniques of data archivisation and data protection		18	18		0		4
9	Genetic algorithms and artificial neural networks	**7**	27	9		18		4
10	Distributed processing	**7**	36	18		18		3
11	Programming of mobile devices	**7**	36	18		18		4
Total of specialist subjects		**6**	**351**	**153**	**0**	**198**	**0**	**45**
Total of core subjects		***16***	***1056***	***486***	***174***	***378***	***18***	***165***
Total of major subjects			**1407**	**639**	**174**	**576**	**18**	**210**
Number of exams		**22**	+diploma exam					

Module VII (specialisation): TELEINFORMATICS – part time

NO	Subject	form of credit	Teaching hours: total	including: lecture	including: tutorials	including: laboratory	including: seminar	ECTS
1	Computer-Aided methods of optimalisation	**6**	27	18		9		3
2	Programming project		36	0		36		4
3	Telecommunications and data transmission	**5**	36	18		18		5
4	Streaming media		36	18		18		4
5	Computer networks	**6**	36	9		27		6
6	Fibre-Optical technologies		18	18		0		4
7	Genetic algorithms and artificial neural networks	**7**	27	9		18		4
8	Techniques of data archivisation and data protection		18	18		0		4
9	Computer systems security		45	18		27		4
10	Programming of mobile devices	**7**	36	18		18		4
11	Wireless systems of teletransmission	**7**	36	18		18		3
Total of specialist subjects		**6**	**351**	**162**	**0**	**189**	**0**	**45**
Total of core subjects		***16***	***1056***	***486***	***174***	***378***	***18***	***165***
Total of major subjects			**1407**	**648**	**174**	**567**	**18**	**210**
number of exams		**22**	+ diploma exam					

Master Informatics – basic curriculum – full time mode

valid since academic year 2012/2013

No	Subject	exam after semester	Teaching hours					ECTS
			Total	including				
				Lecture	tutorials	laboratory	seminar	
I	**Module of core subjects**							
1	Modeling and analysis of computer systems	1	60	30		30		6
2	Analysis of IT Enterprise	3	45	30		15		2
3	Design of information systems	**2**	45	15		30		3
4	Computer Integrated Organisation of Activities		30	15		15		2
	Total		**180**	**90**	**0**	**90**	**0**	**13**
II	**Module of subjects expanding education**							
1	**Elective subject - each student selects one subject from the list**		30	30		0		2
	1. Biocybernetics							
	2. Theory of information							
	3. Control theory							
	4.Graphics design services							
	5. Virual Reality							
	Specialist subjects - depending on the specialisation (modules IV-IX)							
	Subejcts A-including modules IV, V,VI, VII							
2	Document description languages		45	15		30		6
3	Component-Based Programming (WWW)		60	15		45		5
	Total for subjects A		**135**	**60**	**0**	**75**	**0**	**13**
	Subjects B-including modules ,VIII, IX							
2	Animation and Special Effects		60	30		30		5
3	Audiovisual techniques		45	0		45		2
	TOTAL for subjects B		**135**	**60**	**0**	**75**	**0**	**9**
III	**MODULE OF MASTER THESIS**							
1	Seminar		30	0			30	2
2	Master's thesis		0	0		0		20
	Total		**30**	**0**	**0**	**0**	**30**	**22**
SUBEJCTS A - total of core subjects		**3**	**345**	**150**	**0**	**165**	**30**	**48**
including ECTS								**35**
SUBJECTS B - total for core subjects		**3**	**345**	**150**	**0**	**165**	**30**	**44**
including ECTS								**31**

Module IV (specialisation) – DATABASES – full time

valid since 2012/2013

pts. = ETCS

T/l = tutorials or laboratory

No	Subject	exam after sem.	Teaching hours					
			total	including				
				lecture	tutorials	laboratory	seminar	ECTS
IV	**SPECIALIST SUBJECTS**							
1	Database administration		45	15		30		4
2	Programming database clients		45	15		30		2
3	Cryptography	2	60	30		30		5
4	warehouses and Data mining		60	30		30		2
5	Management of network infrustructure	2	45	15		30		5
6	Collective database project		30	0		30		4
7	Electronic commerce systems	1	60	30		30		6
8	Computer networks security	3	60	30		30		2
9	Advanced database systems	1	60	30		30		8
10	Introduction to Data Mining		60	30		30		4
Total of specialist subjects		**5**	**525**	**225**	**0**	**300**	**0**	**42**
Total of core subjects		***3***	***345***	***150***	***0***	***165***	***30***	***48***
Total for major subjects			**870**	**375**	**0**	**465**	**30**	**90**
number of exams		**8**	+ diploma exam					
including ECTS								**77**

Module V (specialisation) – NETWORK INFRASTRUCTURE MANAGEMENT – full time

valid since academic year 2012/2013

No	Subject	exam after sem.	teaching hours					
			total	including				
				lectures	tutorials	labora-tory	seminar	ECTS
V	**SPECIALIST SUBJECTS**							
1	Wireless networks		45	15		30		4
2	Network Programming		45	15		30		6
3	Cryptography	2	60	30		30		5
4	Monitoring and computer networks analysis		60	30		30		2

5	Management of Network Infrustructure	2	60	30		30		5
6	Audit of information systems	2	30	15		15		4
7	Collective project of network infrastructure		30	0		30		4
8	Computer networks security		60	30		30		2
9	Network technologies		30	15		15		2
10	Advanced algorithms		45	15		30		4
11	Introduction to Data Mining		60	30		30		4
Total of specialist subjects		**3**	**525**	**225**	**0**	**300**	**0**	**42**
Total of core subjects		***3***	***345***	***150***	***0***	***165***	***30***	***48***
Total of major subjects			**870**	**375**	**0**	**465**	**30**	**90**
number of exams		**6**	diploma exam					
including ECTS								**77**

Module VI (specialisation) – PROGRAMMING – full time

VALID SINCE 2012/2013

no.	**Subject**	**exam after sem.**	**teaching hours**					
			total	**including**				**ECTS**
				lecture	**tutorials**	**labora-tory**	**seminar**	
VI	**SPECIALIST SUBJECTS**							
1	Analysis of algorithms		60	30		30		4
2	Network programming	1	45	15		30		6
3	Cryptography	2	60	30		30		5
4	Methods of translation	3	60	30		30		2
5	Visual programming	2	60	30		30		6
6	Collective business project		30	0		30		4
7	Games programming		60	30		30		2
8	Contemporary IT tools	3	60	30		30		2
9	Advanced database systems		60	30		30		8
10	Mobile technologies		30	15		15		3
Specilist subjects		**5**	**525**	**240**	**0**	**285**	**0**	**42**
Total of core subjects		***3***	***345***	***150***	***0***	***165***	***30***	***48***
total for major subjects			**870**	**390**	**0**	**450**	**30**	**90**
number of exams		**8**	diploma exam					
including ECTS								**77**

Module VII (specialisation) – INFORMATION SYSTEMS FOR MANAGEMENT – full time

valid since 2012/2013

No.	Subject	exam after sem.	Teaching hours					ECTS
			total	including				
				lectures	tutorials	labora-tory	seminar	
VII	**SPECIALIST SUBJECTS**							
1	Database administration		45	15		30		3
2	Programming of database clients		45	15		30		2
3	Business Analysis		60	30		30		5
4	Data warehouse and data mining	3	60	30		30		2
5	Electronic commerce systems	1	60	30		30		5
6	Digital simulation of economic systems	2	30	15		15		3
7	Information systems in the company	2	45	15		30		5
8	Collective business project		30	0		30		4
9	Applications and web solutions for businesses	3	60	30		30		2
10	Advanced database systems		60	30		30		8
11	Mobile technologies		30	15		15		3
total of specialist subjects		**5**	**525**	**225**	**0**	**300**	**0**	**42**
Total of core subjects		***3***	***345***	***150***	***0***	***165***	***30***	***48***
Total of major subjects			**870**	**375**	**0**	**465**	**30**	**90**
number of exams		**8**	diploma exam					
Including ECTS								**77**

Module VIII (specialisation) – COMPUTER GRAPHICS – full time

valid since 2012/2013

No.	Subject	exam after sem.	Teaching hours					ECTS
			total	including				
				lectures	tutorials	labora-tory	seminar	
VIII	**SPECIALIST SUBJECTS**							
1	Desktop publishing	1	60	30		30		7
2	The composition of graphicS projects		60	30		30		6
3	Graphical programming environment	1	75	30		45		7

4	Interactive graphics	2	75	30		45		7
5	Image processing	2	60	30		30		7
6	Collective graphic design		30	0		30		4
7	Fundamentals of industrial design	3	60	30		30		2
8	Graphics for the Web	3	60	30		30		2
9	High-tech graphics design services		45	15		30		4
Total of specialist subjects		**6**	**525**	**225**	**0**	**300**	**0**	**46**
Total of core subjects		***3***	***345***	***150***	***0***	***165***	***30***	***44***
total of major subjects			**870**	**375**	**0**	**465**	**30**	**90**
number of exams		**9**	diploma exam					
including ECTS								**77**

Module IX (specialisation) – AUDIOVISUAL ENGINEERING – full time

valid since 2012/2013

No	Subjects	exam	Teaching hours					
			total	w tym				ECTS
				lecture	tutorials	labora-tory	seminar	
IX	**SPECIALIST SUBJECTS**							
1	Basics of digital recording and sound editing		60	30		30		6
2	The composition of graphicS projects		60	30		30		6
3	Basics of digital composition	1	60	30		30		6
4	Basics of digital video recording	1	75	30		45		6
5	Digital picture editing		45	15		30		5
6	Collective audivisual project		30	0		30		4
7	Sound recording workshop		45	0		45		4
8	Advertising production	2	60	30		30		5
9	Digital TV	3	30	30		0		1
10	Audiovisual forms workshop		45	0		45		2
11	Multimedia publications		30	0		30		1
Total of specialist subjects		**4**	**540**	**195**	**0**	**345**	**0**	**46**
Total of core subjects		***3***	***345***	***150***	***0***	***165***	***30***	***44***
total of major subjects			**885**	**345**	**0**	**510**	**30**	**90**
number of exams		**7**	diploma exam					
including ECTS								**77**

Master Informatics – basic curriculum – part time mode

valid since 2012/2013

No	Subject	exam after sem.	teaching hours					ECTS
			total	including				
				lectures	tutorials	laboratory	seminar	
I	**MODULE OF CORE SUBJECTS**							
1	Modeling and analysis of computer systems	1	36	18		18		6
2	Analysis of IT Enterprise	3	27	18		9		2
3	Design of information systems	**2**	27	9		18		3
4	Computer Integrated Organisation of Activities		18	9		9		2
	TOTAL		**108**	**54**	**0**	**54**	**0**	**13**
II	**MODULE OF SUBJECTS EXPANDING EDUCATION**							
1	**Elective subject - each student selects one subject from the list**		18	18		0		2
	1. Biocybernetics							
	2. Theory of information							
	3. Control theory							
	4.Graphics design services							
	5. Virual Reality							
	Specialist subjects - depending on the specialisation (modules IV-IX)							
	Subejcts A-including modules IV, V,VI, VII							
2	Document description languages		27	9		18		6
3	Component-Based Programming (WWW)		36	9		27		5
	TOTAL FOR SUBJECTS A		**81**	**36**	**0**	**45**	**0**	**13**
	Subjects B-including modules ,VIII, IX							
2	Animation and Special Effects		36	18		18		5
3	Audiovisual techniques		27	0		27		2
	TOTAL FOR SUBJECTS B		**81**	**36**	**0**	**45**	**0**	**9**
III	**MODULE OF MASTER THESIS**							
1	Seminar		18	0			18	2
2	Master's thesis		0	0		0		20
	TOTAL		**18**	**0**	**0**	**0**	**18**	**22**
SUBEJCTS A - total of core subjects		**3**	**207**	**90**	**0**	**99**	**18**	**48**
including ECTS								**35**
SUBJECTS B - total for core subjects		**3**	**207**	**90**	**0**	**99**	**18**	**44**
including ECTS								**31**

Module IV (specialisation) – DATABASES – part time

valid since 2012/2013

No.	Subjects	exam after semester	teaching hours					
			Total	including				ECTS
				lecture	tutorials	laboratory	seminar	
IV	**SPECIALIST SUBJECTS**							
1	Database administration		27	9		18		4
2	Programming database clients		36	9		27		2
3	Cryptography	2	36	18		18		5
4	warehouses and Data mining		36	18		18		2
5	Management of network infrustructure	2	36	18		18		5
6	Collective database project		18	0		18		4
7	Electronic commerce systems	1	36	18		18		6
8	Computer networks security	3	36	18		18		2
9	Advanced database systems	1	45	18		27		8
10	Introduction to Data Mining		36	18		18		4
Total of specialist subjects		**5**	**342**	**144**	**0**	**198**	**0**	**42**
Total of core subjects		***3***	***207***	***90***	***0***	***99***	***18***	***48***
Total for major subjects			**549**	**234**	**0**	**297**	**18**	**90**
number of exams		**8**	diploma exam					
INCLUDING ECTS								**77**

Module V (specialisation) – NETWORK INFRASTRUCTURE MANAGEMENT – part time

valid since academic year 2012/2013

No.	Subjects	exam after sem.	teaching hours					
			total	including				ECTS
				lectures	tutorials	laboratory	seminar	
V	**SPECIALIST SUBJECTS**							
1	Wireless networks		27	9		18		4
2	Network Programming		36	9		27		6
3	Cryptography	2	36	18		18		5
4	Monitoring and computer networks analysis		36	18		18		2
5	Management of Network Infrustructure	2	36	18		18		5

6	Audit of information systems	2	27	18		9		4
7	Collective project of network infrastructure		18	0		18		4
8	Computer networks security		36	18		18		2
9	Network technologies		27	9		18		2
10	Advanced algorithms		27	9		18		4
11	Introduction to Data Mining		36	18		18		4
Total of specialist subjects		**3**	**342**	**144**	**0**	**198**	**0**	**42**
Total of core subjects		***3***	***207***	***90***	***0***	***99***	***18***	***48***
Total of major subjects			**549**	**234**	**0**	**297**	**18**	**90**
number of exams		**6**	diploma exam					
including ECTS								**77**

Module VI (specialisation) – PROGRAMMING – part time

VALID SINCE 2012/2013

No.	SUBJECTS	exam after sem.	teaching hours					
			total	including				
				lecture	tutorials	labora-tory	seminar	ECTS
VI	**SPECIALIST SUBJECTS**							
1	Analysis of algorithms		36	18		18		4
2	Network programming	1	36	9		27		6
3	Cryptography	2	36	18		18		5
4	Methods of translation	3	36	18		18		2
5	Visual programming	2	45	18		27		6
6	Collective business project		18	0		18		4
7	Games programming		36	18		18		2
8	Contemporary IT tools	3	36	18		18		2
9	Advanced database systems		45	18		27		8
10	Mobile technologies		18	9		9		3
Specialist subjects		**5**	**342**	**144**	**0**	**198**	**0**	**42**
Total of core subjects		***3***	***207***	***90***	***0***	***99***	***18***	***48***
total for major subjects			**549**	**234**	**0**	**297**	**18**	**90**
number of exams		**8**	diploma exam					

including ECTS		77

Module VII (specialisation) – INFORMATION SYSTEMS FOR MANAGEMENT – part time

valid since academic year 2012/2013

No.	Subject	exam after sem.	Teaching hours total	including lectures	tutorials	laboratory	seminar	ECTS
VII	SPECIALIST SUBJECTS							
1	Database administration		27	9		18		3
2	Programming of database clients		36	9		27		2
3	Business Analysis		36	18		18		5
4	Data warehouse and data mining	3	36	18		18		2
5	Electronic commerce systems	1	36	18		18		5
6	Digital simulation of economic systems	2	27	9		18		3
7	Information systems in the company	2	27	9		18		5
8	Collective business project		18	0		18		4
9	Applications and web solutions for businesses	3	36	18		18		2
10	Advanced database systems		45	18		27		8
11	Mobile technologies		18	9		9		3
total of specialist subjects		**5**	**342**	**135**	**0**	**207**	**0**	**42**
Total of core subjects		***3***	***207***	***90***	***0***	***99***	***18***	***48***
Total of major subjects			**549**	**225**	**0**	**306**	**18**	**90**
number of exams		**8**	diploma exam					
Including ECTS								**77**

Module VIII (specialisation) – COMPUTER GRAPHICS – part time

VALID SINCE 2012/2013

No.	Subject	exam after sem.	Teaching hours total	including lectures	tutorials	labora-tory	seminar	ECTS
VIII	SPECIALIST SUBJECTS							
1	Desktop publishing	1	36	18		18		7

2	The composition of graphics projects		36	18		18		6
3	Graphical programming environment	1	45	18		27		7
4	Interactive graphics	2	54	18		36		7
5	Image processing	2	45	18		27		7
6	Collective graphic design		18	0		18		4
7	Fundamentals of industrial design	3	36	18		18		2
8	Graphics for the Web	3	45	18		27		2
9	High-tech graphics design services		27	9		18		4
Total of specialist subjects		**6**	**342**	**135**	**0**	**207**	**0**	**46**
Total of core subjects		***3***	***207***	***90***	***0***	***99***	***18***	***44***
total of major subjects			**549**	**225**	**0**	**306**	**18**	**90**
number of exams		**9**	diploma exam					
	including ECTS							**77**

Module IX (specialisation) – AUDIOVISUAL ENGINEERING – part time

valid since 2012/2013

No	**Subjects**	**exam**	**Teaching hours**					
			total	**w tym**				
				lecture	**tutorials**	**labora-tory**	**seminar**	**ECTS**
IX	**SPECIALIST SUBJECTS**							
1	Basics of digital recording and sound editing		45	18		27		6
2	The composition of graphicS projects		36	18		18		6
3	Basics of digital composition	1	36	18		18		6
4	Basics of digital video recording	1	45	18		27		6
5	Digital picture editing		36	9		27		5
6	Collective audivisual project		18	0		18		4
7	Sound recording workshop		27	0		27		4
8	Advertising production	2	36	18		18		5
9	Digital TV	3	18	18		0		1
10	Audiovisual forms workshop		36	0		36		2
11	Multimedia publications		18	0		18		1
Total of specialist subjects		**4**	**351**	**117**	**0**	**234**	**0**	**46**
Total of core subjects		***3***	***207***	***90***	***0***	***99***	***18***	***44***
total of major subjects			**558**	**207**	**0**	**333**	**18**	**90**

number of exams	**7**	diploma exam					

Analysis of the peers:

The auditors refer to the learning outcomes for the analysis and assessment of the curricula of the programmes.

According to the HEI representatives, a core curriculum for both Bachelor and Master programme is defined by the Polish Ministry of Education and Science. The ministerial regulations are supposed to define the contents and learning objectives, i.e. the core curriculum and individual subject areas and the competences associated with each area. The peers had only been provided the curricula as implemented by the HEI. However, in order to come to a final assessment to what extent the HEI are bound by the regulations and/or have flexibility in their curricula, the peers ask for the ministerial regulation stipulating the requirements (standard) for the degree programmes. The HEI states that flexibility within this framework is in fact limited. Up till 2011 all HEIs had to fully comply with the standards. In 2012, there has been a change as the ministerial procedure is now less detailed than it used to be. In other words, the Bachelor degree offers about 30% flexibility in terms of content allowing to define specialised modules within this range. As for the Master the flexibility in terms of content revolves around 40%. Regarding the development of the curriculum the Faculty Council drafts the modules and its content which is finally supervised with the Dean. Every year, the programme is according to the HEI modified - if necessary - within the flexible range. The Bachelor in Engineering has an obligatory duration of seven semesters and each student is supposed to take an internship with a total workload of 160 hours.

The peers asked for the reason behind the number of specialties with three in the Bachelor and six in the Master programme. The peers learned that actually there are offered only three specialisations in the Master programme: Computer Graphics, Programming and Network Infrastructure Management. They therefore decided to assess and come to a recommendation on the accreditation for only these specialisations.

The peers tried to understand the study plan for each of the specialisations having in mind the overall objectives and learning outcomes of the degree programmes as well as the learning outcomes for each subject (i.e. module). They faced however difficulties due to two issues:

First, the tables provided above do not give the overview of the curricula for each of the specialisations as considered useful. As it only shows the modules of the core curriculum *or* the specialisation by showing all other information such as teaching hours, teaching

form, exam, ECTS etc. the peers have difficulties to assess the curricula as such. Therefore the peers asked the HEI for a graphical presentation and/or visual overview of the curricula for each specialisation in order to have an overview of the modules of the core curricula plus the specialisation modules allocated to the seven (Bachelor) or three semesters (Master) respectively.

Second, as mentioned in chapter 2.3 the peers missed numerous descriptions of subjects (i.e. modules). A final assessment of the actual contribution of the curriculum, i.e. the combination of modules, to the intended learning outcomes is, thus, not possible at this stage.

Nevertheless, they tried to analyse the curriculum based on the information they were provided. They got the impression that the Bachelor modules do contribute to the intended learning outcomes, however on a rather basic level. For example, the module "Computer-Aided Methods of Optimalisation" which is foreseen in the 5th semester states the following learning outcomes: "The student knows how to use computer–aided method of optimisation knows basic optimization models, knows basic terms and techniques of single and multi- variable functions. The student can choose the simple optimization model, can apply a chosen method to solve a variety of mathematical problems resulting from modelling engineer assignments, can interpret the achieved results and formulate correct statements and can estimate and evaluate the results obtained." Based on the content the learning outcomes will be achieved on the module level. However, the peers consider these learning outcomes as rather at the lower level for a student in a fifth semester. Another example is the module "Operating Systems Administration" foreseen for the 4th semester. According to the peers it rather describes the technical or manual skills on the level of a technician in information technology than on the Bachelor level. The peers also refer to the module "Embedded systems" which should go beyond generic knowledge due to the fact that it is foreseen in semester 7. Moreover, this module should emphasise the holistic approach of Embedded Systems in a system context taking into account impacts and reactions, security, reliability and fail-safe stability, etc. The module description does not seem to reflect these aspects.

Based on the limited information, the peers got the impression that the intended learning outcomes of the Master programme cannot be achieved. For example, for the module "Genetic algorithms and artificial neural networks" (which is allocated to the first and second cycle programme), the following learning outcomes are stated: "The students knows and understands variety of genetic and evolutionary algorithms and neural networks, knows and understands capabilities and range of implementation of algorithms of a certain class, can use contemporary programming tools used to perform calculations and has the skill of using models based on genetic algorithms and neural networks and

can experiment, evaluate, verify and assess the usability of algorithms needed to perform a certain class of tasks." According to the peers, these learning outcomes do not reflect the intended academic level of a Master programme. Artificial Intelligence seems to be restricted to Genetic Algorithms and Neural Networks, leaving out Rules, Prolog, Constraints and Fuzzy Approaches. The description of the learning outcomes of the module "Monitoring and computer network analysis" (3rd semester) also rather describes the technical or manual skills on the level of a technician in information technology (e.g. the student can choose a correct place and tools in order to monitor required section of the network and can analyse traffic and event logs on the network according to the suitable criteria). The peers' doubts on the level of the learning outcomes apply similarly to the module "Management of Network Infrastructure". Students having passed this module are supposed to be able to use tools to manage network resources, to monitor transport and applications protocols, to manage configurations and efficiency of LAN and to configure hardware resources using SNMP protocol. According to the peers, the skills are expected for a technician or a student at the Bachelor level. Another example is the fact that students seem not to be taught limits of computation, e.g., problems that are undecidable like the halting problem, or problems that are not efficiently solvable such as the NP-complete ones, although this knowledge is important for practical problems as it protects students from trying to program solutions that are known not to exist. Also, students seem not to be taught Formal Languages which are important e.g. for writing compilers. At least a student aspiring to get a doctoral degree must know these subjects. In light of the intended learning outcomes and content of the modules of the Master programme the peers have serious concerns whether the expected qualification level can be achieved and the graduates are enabled for a PhD programme.

Regarding the practical application in the Bachelor programme the peers had difficulties to identify a typical task in the laboratories. They understood that out of about 50 students three groups are formed in the laboratories, even though they work individually is, e.g. to install or to create a Virtual Private Network. During their tour through the premises the peers had the chance to look at a laboratory task of first semester Bachelor students. They perceived the task as very low academic level even for first semester students. However, in order to finally assess the level and content of the laboratory assignments they asked the HEI for descriptions of laboratory assignments of selected modules (e.g. network security).

The students appreciated the very practical approach of the Bachelor programme. They assessed the lectures compared to the TU Łódź as more forward thinking. They could compare the lectures as some of the students are also enrolled in the same degree programme at the TU Łódź. The students welcome the flexibility of the teachers at the HEI

under scrutiny as they are open to test new ways of teaching, e.g. they are allowed to apply other programming languages and students are also encouraged to do so.

The peers consider the intended skills in a foreign language in the Bachelor programme as desirable. However, the peers could not detect if the B2 level according to the Common European Framework can in fact be achieved. They questioned if 72 hours of lecture distributed over four semesters without obviously any self-study time is in fact achievable. The entrance level, e.g. the level after the Matura, is not clear, thus, the peers cannot assess the feasibility of achieving the B2 level. For example, they assume the necessity of learning in small groups in order to enable the students to acquire competences in speaking.

Assessment of the peers:

Criterion 2.6 Curriculum/content

Subject to the provision of a better graphical presentation of the curricula and the description of the laboratory assignments of selected modules, the peers come to the following assessment:

Based on the given information and subject to the missing descriptions of the subjects (i.e. modules), the auditors found that the curricula of the Master programme do only support in a limited way the achievement of the intended overall learning outcomes at the intended academic level.

According to the module descriptions the auditors had at their disposal during the on-site visit and the information provided by the academic teachers and students, the curriculum of the Bachelor programme is strongly oriented towards the acquisition of easily applicable practical skills and puts less emphasis on theoretical and methodological foundations of the discipline. The peers saw room for improvement to enable graduates of this programme to further develop their competences (also in a life-long-learning approach) and to adapt to new developments in the disciplines, concentrating on basic concepts and theoretical and methodological foundations as well as on practical application. In other words, it will be very difficult for graduates to independently complement and deepen the knowledge acquired during their studies and to adapt to developments in the field.

With reference to the curriculum of the Master programme the peers have stronger concerns regarding the achievements of the learning outcomes at the academic level sought. The curriculum consists of a number of modules dedicated to the acquisition of fundamental skills and knowledge required which are to be expected for the Bachelor programmes in order to be enabled to successful accomplish the Master programme at the

intended academic level. Taking into account the access requirements that enable Bachelor graduates of *every* subject, it is not surprising to have a number of basic modules in order to level off the competences at the beginning of the Master programme. Accordingly, the concept of the Master programme does not reflect the advanced academic skills of students who have already acquired a first academic degree in the subject of informatics. Overall, the auditors found that the modules do not adequately reflect the level of knowledge and skills students enrolled in the Master programme should possess. This hinders students to achieve the overall learning outcomes intended in the Master programme and the qualification level of a Second Cycle programme. The peers have concerns whether - on a long run - the intended learning outcome can in fact be achieved in the Master programme at the HEI considering the framework conditions (in terms of legal requirements, institutional environment, technical and financial equipment, research activities, etc.) the HEI is operating in.

In order to achieve the intended CEF language level B2 at the end of the 4th semester for the Bachelor students it is recommended to intensify language teaching in small learning groups, motivate free speaking as well as talking to one another as well as to a mother-tongue teacher. It is further recommended to ensure that students are ensured sufficient self study time on top of the tutorial presence.

B-3 Degree programme: structures, methods and implementation

B-3-1 Structure and modularity

The Bachelor programme includes four obligatory modules (120 ETCS) and an extra module intended to be a specialty (90 ETCS) among which the student can choose from programming and databases, teleinformatics and computer graphics. The second module includes education-expanding subjects, the third one the practical training module and finally the fourth the diploma thesis module. The last three semesters are devoted to one of the specialisation modules. The number of the hours at the Bachelor's degree for certain subjects (mathematics, physics, electronics) cannot be lower than as it is issued in the Regulations of the Department of Sciences and Higher Education.

The Master programme includes three modules (90 ETCS). Module of the core subjects (I) and the thesis module (III) are mandatory (48 or 44 depending on the system in the selection of module II). Module II is a module of specialisation. Students may choose from the following specialisations, databases (42 ETCS), network infrastructure management (42

ETCS), programming (42), systems management (42 ETCS), computer graphics (46 ETCS), audiovisual engineering (48 ETCS).

The Bachelor programme comprises a total of 210 ECTS credit points, the Master programme a total of 90 ECTS credit points; the model curricula included in the documentation indicate that in each programme, as a rule, 30 ECTS credit points are awarded each semester.

Analysis of the peers:

The members of the accreditation team take note of the presented concepts for modularization. They got the impression that a module is differently defined at the HEI than it is done according to the ASIIN standards. As mentioned above a module seems to be a kind of "container" of subjects which are described separately. A specialty is also called module consisting of several subjects that are supposed to lead to a deepening of competences in a specific field of informatics.

The auditors discuss with the representatives of the HEI the international mobility of students. They learn that the HEI does not have exact information of the number of students that go abroad for a semester but confirm that a number of students go abroad. Support will be provided via the international office that offers exchange programmes such as Erasmus and they encourage their students to use the opportunity to get ECTS points abroad. The students showed interest to go abroad and confirmed that some do an exchange semester but they do not feel very much encouraged.

Assessment of the peers:

Criterion 3.1 Structure and modularity

The programmes consist of modules, however, each module is not considered yet as a coherent and consistent package of teaching and learning in itself. This view is rather valid for the so-called subjects within the modules.

The subjects (i.e. modules) are organised to ensure that it is possible to commence the programme in every semester when admissions take place.

The size and duration of the modules (so-called subjects) do allow students to combine them flexibly and facilitate the transfer of credits.

The programme concept allows for time to be spent at another higher education institution or on a practical placement without loss of time. However, the peers recommend encouraging the students more strongly to go abroad for one semester or year.

B-3-2 Workload and credit points

According to the information given during the visit, one ECTS credit point represents approximately 25 - 30 hours workload for the students. According to the information in the self-assessment report the average count of 10 to 12 hours of the student's activity is credited with 1 ETCS. Student's activity is accordingly perceived as the active attendance in the classes and additionally student's own work relating to the degree of difficulty of the subject. The full-time mode of studies involves according to the self-assessment report 1/3 of the student's own work and for the part-time mode of studies not less than ½.

The internship (practical training) awarded with 2 ECTS CP is integrated into the curriculum and supervised by teaching staff from the HEI.

Analysis of the peers:

Attendance of lectures is mandatory. The number of credit points associated with each subject (i.e. module) mostly ranges between 3 and 9 ECTS credit points.

The peers asked to specify how many hours correspond to one ECTS credit point. Thus, one CP is worth 25-30 hours. The peers find out that the allocation of credit points and hours of workload does not always correspond or that it is not comprehensively and transparently displayed. They understood that only the workload for the presence time is stipulated. According to the explanation of the HEI some subjects (i.e. modules) have by mistake been given one ECTS point for 30 hours of presence time. For example, the English module definitely requires some self-study time.

Regarding the part time programme the members of the audit team understood that this mode is also subject to the ministerial regulation. Thus, both modes need to have the same curricula while the part time mode has less presence time (teaching hours) and accordingly more time is dedicated to the self-study time. Part time is held from Friday until Sunday as the students are employed in a company or run a company themselves (mainly related to their studies). The auditors wondered how these students are enabled to achieve the learning outcomes at the same level if they have less teaching hours that should provide fundamental and basic knowledge which is now left to the students' self-study time. During the on-site visit only one part time student was present, so that the peers did not get an immediate impression of the situation of these students. The representatives of the HEI confirmed that these students are mainly not employed full time and need to work harder than the full-time students. About 50% of the students have so far applied for one or more additional semester in order to finish the studies successfully. It is up to the Dean to decide individually if the programme will be prolonged.

Moreover, the peers could not comprehend why some subjects of the part time programme have been allocated ECTS CP different from the full-time mode even though it was said that both curricula are the same. Therefore, they asked the HEI for an explanation for each relevant module why the given credit points for full time and part time mode are different in the same module (e.g. operation systems, operating systems administration, basics of electronics).

Assessment of the peers:

Criterion 3.2 Workload and credit points

A credit point system is in place. 60 credit points are awarded each year, 30 per semester. However, the peers come to the conclusion that it is not yet transparently and comprehensively applied. Therefore, the peers consider it necessary that all the work done by students is appropriately represented within 25–30 hours per 1 CP (presence time and self-study time). The allocation of credit points to modules should take into account the ECTS guidelines.

The peers are assured that credit points are only given if the learning objectives of a module have been achieved.

Based on the information provided and the feedback of the students, the auditors found the overall work load for the *full-time students* acceptable. For the *part-time studies*, they have certain doubts that part time students can complete the programme successfully and achieve the same qualification as full-time students – given that their curriculum encompasses a significantly lower number of contact hours which are moreover concentrated on the weekends (Friday to Sunday) so that the programmes may be completed parallel to holding a (full-time or part-time) job. The peers consider it therefore necessary to adapt the curriculum in such a way that students are enabled to graduate in the standard period of study even if they work full time. The concept for the adapted curriculum should also include a detailed description of student workload, a description of the organisation of supervision and advice of students (especially outside of the classroom hours), a description of the organisation of projects for part-time studies. It is important that the documentation clearly indicates that the programme outcomes for part-time studies are identical to those of the full-time studies; graduates must have acquired the same set of skills and competences.

B-3-3 Educational methods

According to the self-assessment report, the following educational methods are in use:

For the Bachelor: The knowledge is presented during information, problem and conversational lectures which are conducted with help of multimedia tools and widely known databases. There are also laboratory and design classes, collaborative studies and individual projects which improve individual and social skills.

For the Master: Knowledge is gained by students during informative and problem-solving lectures, with the use of the techniques of conventional media and public indication of the knowledge bases. Tutorials, laboratories, project oriented tutorials, group developments and individual projects allow students to develop and master individual skills and abilities as well as help with learning and maintaining social competences.

Options for elective modules are available through the specialisations.

Analysis of the peers:

Based on the documentation and the discussion during the visit the auditors find the applied teaching methods basically appropriate for the achievement of the educational goals. They only got the impression that the teaching method is less interactive and encouraging for discussion.

Assessment of the peers:

Criterion 3.3 educational methods

The teaching methods and tools support basically the achievement of the learning outcomes at the intended level by the time the degree is completed. Regarding the laboratories the peers postpone their assessment until the additional information is provided. By now, they recommend to integrate the educational method “seminar”.

Besides compulsory components, there is a sufficient range of elective and compulsory elective modules to allow students to develop an individual focus.

B-3-4 Support and advice

The HEI describes their offers for support and counselling of students as follows:

The academic staff of the Academy of Computer Sciences and Skills is available for students at certain times during the weekdays. Moreover, each student can reach the teachers via email. Handouts are sent to students in electronic form.

The Rules of the Studies define the range of student support in extraordinary situations (pregnancy, disability, illness etc.). All the incidents connected with student support in extraordinary situations and not mentioned in the internal documents of the Academy,

are thoroughly discussed after submitting written information to the Rector or the Chancellor of the Academy in accordance with Polish legal system.

Analysis of the peers:

The peers discussed with the students the support and offers for consulting services. They perceived a high satisfaction of the students with the programme and the institution as such and in particular with the availability of professors and teachers.

Assessment of the peers:

Criterion 3.4 Support and advice

Sufficient resources are available for offering individual support, supervision and advice to students.

The advisory methods envisaged (subject-specific and general) are suitable for supporting students to achieve the learning outcomes and complete their degree within the normal period of study.

There is a corresponding range of support available for different student groups.

B-4 Examinations: system, concept and organisation

According to the self-assessment report the following **exam methods** are foreseen:

Bachelor programme:

The examinations from the lecturing sessions are conducted in a written as well as oral form for each subject. The form of the examination is described in the syllabus (i.e. module descriptions). The skill developing classes (workshops and laboratories etc.) are graded according to the students' activity, partial grades for the tasks completed in the subject of attending the classes and individual work. The examination tests the knowledge and skills acquired by the student in the range defined by the content of each subject.

Master programme:

There are different modes of examining the students: activity in the class, obtaining information and presenting it in front of the group, oral-written exam or test in the lecture, written exam based on the short summary of a few physical phenomena (dyslexic students-spoken one). A grade for the student's activity and participation in the class is ap-

pointed together with a grade for summary of the results' of measurements. Written task involves solving 3-5 problems out of 6-10 assigned by the teacher, lecture: written exam. Laboratory: assignment realized in the class.

The final thesis for both programmes is prepared by the student under the supervision of the thesis supervisor. The role of the supervisor can be taken by an academic teacher with scientific degree of professor or academic degree of "doktor habilitowany" (associate professor). In justified cases the role of the supervisor can be taken by an academic teacher with the academic degree of doctor, appointed and authorized by the Faculty Council. Selection of the subject of thesis by the student is possible only when the student has maximum one failure in the completion of the course. Students' academic and scientific interests as well as University's capacity and educational offer shall be taken into consideration when settling topics of dissertations. The student has to participate in a diploma seminar conducted by the supervisor. Detailed conditions of when the student is allowed to take the graduation examination shall be available in Faculty Diploma Regulations. The graduation examination takes place in front of the commission appointed by the Dean. The graduation examination is conducted in oral form. The date of examination is determined by the Dean. The examination should take place not later than within one month since the completion of the dissertation.

The **organisation of exams** is managed as follows:

The dates of the examinations are established at the beginning of a new academic year and provided to the students. The timetable of the academic year comes into force with the Rector's order. There are two exam dates I and II (makeup session). The Dean is capable of prolonging the date of the makeup session of the examination in extraordinary and certified situations (health problems, family problems, participation in competitions at the national level and higher… etc.).

The subject (i.e. module) is completed on the basis of the control of the educational results. The examination is conducted by the teacher of a given subject. In extraordinary cases the teacher can be substituted by another member of the academic staff appointed by the Dean.

All subjects included in the programme of the studies are completed with a graded test or examination. The completion of the subject is confirmed by the grade in accordance with the programme of the studies. The results of the test are provided by the teacher himself or via Virtual Register. The access to the Virtual Register is secured by a password assigned to each student.

Each examination described in the programme of the studies is conducted separately and is graded individually.

Students take the examination in the time established by the teacher. The date of the examination cannot collide with either another classes or student apprenticeship.

If the student gets a negative grade, he is entitled to write a makeup test.

The student, who complains about the refusal of the completion of the subject, has the right to appeal to the Dean within 7 days. In well-grounded cases the Dean together with the director of the appropriate unit makes the decision about calling the Committee in order to check the student's knowledge. The Committee includes the following members:

- the Dean or the Director of the academic unit as a chairman;
- the teacher of the subject;
- additional expert in the same field as the teacher of the subject;
- the Students' Union representative as an observer (the examination can take place without him).

The examination, whose aim is to check the student's knowledge, is supposed to be conducted in the presence of the Committee and should take place within 7 days from the date of the Dean's approval. The decision is delivered by a majority of votes and in case of the equal number of votes the decision is taken by the chairman.

If a student does not come to the test or examination during the examination session without any excuse, next possibility to take the examination falls on the makeup session with all its consequences.

Analysis of the peers:

The peers discussed the types of exams applied in the programme. They found out that exams are taken as multiple-choice tests via an online-tool, and also in a written or oral form or practical exams on the laboratories. The students take two tests per semester, one in the middle and one at the end of the semester.

The peers saw that the general rules of studies refer to Faculty Diploma Regulations which they had not been provided so far. In order to assess these rules and, thus, to come to a final decision on the exam regulations the peers asked the HEI for this document.

The audit team reviewed the selection of final projects and exam papers. Basically, they found it difficult to evaluate the material provided as it was delivered in Polish. Nevertheless, the documents presented were suitable to come to an assessment. The peers learned that students have one semester to prepare the thesis and it is graded by two

persons whereas one has to be from the academic staff of the Faculty. The topic of the final thesis is either offered by the teacher or proposed by the students. The final thesis is examined by an oral exam.

Assessment of the peers:

Criterion 4 Examinations: system, concept and organisation

The type, organisation and distribution of examinations are designed to support the attainment of the intended learning outcomes by the time the degree is completed. Examinations are coordinated so that students have sufficient time to prepare for them.

The timescale for marking exams does not interfere with individual academic progression; in particular, it is possible to move directly from a Bachelor's degree to a Master's programme without loss of time.

The form of examination is laid down in the module description for each module (here: subject). It is ensured that at the commencement of the teaching term, students are informed as to examination and pre-examination requirements, which must be in line with the module objectives.

The examination organisation guarantees examinations that accompany study and avoids causing extensions to the period of study.

The evaluation criteria are basically transparent for lecturers and students.

The supervision of final theses carried out externally is subject to regulations ensuring its meaningful incorporation within the curriculum.

Both degree programmes end with a final thesis and an oral examination of the thesis. At least one of the examiners of the final thesis belongs to the body of professional lecturers who deliver the programme.

The auditors gained the impression that the final thesis of the Bachelor programme is still acceptable in order to achieve the intended level. The peers confirmed - as mentioned by the HEI – that the objective of the Bachelor programme is mainly to enable the students to a practical approach. The scientific research seemed to only reflect a smaller part in the thesis. Nevertheless, the peers came to the conclusion that the academic level achieved is still in line with the European Qualifications Framework for a Bachelor degree.

The final thesis of the Master programme is according to the peers below the academic level of the qualification sought. The master theses also seem to pursuit a rather practical approach (not an application-oriented scientific approach). The auditors have serious

concerns that graduates are enabled to do research and scientific work on a Master level and are prepared to enter a PhD degree programme. Also the access to scientific literature seems to be very limited (see chapter 5.3) as well as the integration of students in research activities and/or projects of lecturers (see chapter 5.2). The peers came to the conclusion that the requirements of the ASIIN Subject-Specific Criteria are not met taking into account the length of the final thesis which according to the peers cannot ensure that students will work on a problem independently and at a level in accordance with their degree.

B-5 Resources

B-5-1 Staff involved

According to the HEI, the total number of titular Professors and PhDs who are employed at the Computer Science Course is 16, 17 doctors and 3 with a master's degree. The tutors with the doctor's degree and above have a certified academic background and record in their fields of science confirming their qualifications to conduct the classes at the programmes.

The self-assessment report states the following main research fields relevant to the degree programmes: Artificial Intelligence, Algorithms in Medicine and Engineering, Development and Research of Virtual Systems, and Computer Modelling.

The SAR states research work on the following topics:

- Organisation of two scientific conferences related to the electronic economy,
- Computer-oriented modelling of the mechanically and thermally-weighted construction with the application of parallel and dispersed processing methods,
- Ferromagnetic modelling within the work phase in the conditions of deformed magnetic current,
- Decision support systems,
- Designing a genetic, insular algorithm carried on many workstations simultaneously.
- Telecommunication and data transmission for computer scientists,
- Occupational safety and health and ergonomics.

Analysis of the peers:

The peers recognized that each subject has in fact to be given twice: in the full time mode and in the part time mode. Moreover, there are officially three specialisations in the

Bachelor and six in the Master. The HEI stated that there are only three specialisations in fact offered (see above) which leads to a reduction in teaching hours. The peers understood the following after an intensive discussion: Professors have 160 - 200 teaching hours per academic year (which means about 6 – 7 hours per week) plus preparing the lecturing, supervising theses, administration etc. Doctors have to give 240 teaching hours per year (about 8 hours per week). One teacher gives in fact both lectures for part time and full time. In addition, the peers discovered that quite a number of teachers also give lectures at the Technical University of Łódź. According to the HEI all teachers have a full time contract at the HEI under scrutiny and some of them in addition a contract with the TU Łódź. The peers did not get a full picture of how many hours each teacher in fact gives at the HEI. Therefore, they asked the HEI to list the teaching staff for both programmes specifying the total teaching hours. This information is required for a final assessment of the teaching capacity.

Also not fully comprehensive for the peers were the number of teachers which were present during the visit but not mentioned in the documentation and vice versa. In order to have the full information basis required for the final assessment, the audit team asked the HEI for the information on the teaching staff including the name, the qualification and research activities. The peers suggested using the form for the personal handbook as offered by ASIIN.

Regarding the time available for research the peers learned that the academic staff does research at the HEI under scrutiny as well as at the TU Łódź. Students were according to the academic staff also involved in research, in particular in the organisation and preparation of conferences. They also present papers and research results at conferences. The academic staff stated that research time for them is about double the teaching time.

Responsible for the laboratories are four technicians which have graduated in Informatics or are enrolled in such a degree programme. In addition, the teachers are also responsible for the laboratories.

During the discussion the peers gained the impression that most of the teachers do not have to have any industrial experience and only little have any professional experience in a company. Regarding the recruitment of staff, the peers were not able to come to final assessment and, thus, asked the HEI to provide the regulations on the recruitment procedure for academic staff.

Assessment of the peers:

Criterion 5.1 Staff involved

The peers did not come to a final decision yet if the teaching capacity is adequate.

Regarding the research activities the peers had difficulties to assess it finally. From the discussions on-site they got the impression that the research activities referred to by the lecturers rather comprises the organisation and preparation of conferences including editing the conference proceedings. Nevertheless, concrete research activities of some lecturers could be detected in the conference proceedings provided during the on-site visit. However, it could not be clarified to what extent students were involved in research activities apart from organisational issues. If and how research and development activities of teaching staff are such as to ensure that the educational level sought is attained can only be assessed based on the requested information. The requested information on the academic staff will allow judging the research activities more reliably, if it contains publication lists as discussed when the requests for additional information were described.

The available contact hours (overall and for individual lecturers) seem to be sufficient for teaching and student supervision.

B-5-2 Staff development

The institution reported on the following measures to subject-related and didactical further training for staff:

Academic staff participates in workshops in the area of didactics depending on the needs. Methodological seminars and didactical trainings of employees are organized on a regular basis (or in the 'on demand' mode). For example, to adapt the University's curriculum to the National Qualification Framework requirements (compliant with the Bologna process) there have been 3 trainings organized. All trainings for academics who teach at second cycle programmes are obligatory.

Analysis of the peers:

The auditors noted that the teaching staff members have possibilities to develop and train their didactic and professional skills.

Assessment of the peers:

Criterion 5.2 Staff development

Opportunities for further development of subject-relevant knowledge and teaching skills are available for lecturers.

B-5-3 Institutional environment, financial and physical resources

The self-assessment report provides information about the equipment, laboratories, servers and technological infrastructure as such.

In order to provide the appropriate realization of the didactic aims in the process of development, the Academy of Computer Sciences and Skills took care of its own academic campus which comprises a set of buildings with didactic and lecture rooms, a library and reading room, student's canteen, administration units, a Sport Centre and two Halls of Residence.

Main financial sources of the Academy are the tuition fees and the sources obtained within the European Funds Programmes particularly HR Programme.

Analysis of the peers:

As the self-assessment report provides only little information about the institutional environment the peers asked for an explanation of the higher education system and the classification of the HEI under scrutiny among this system. They learned that HEIs are divided into two groups: academic institutions and vocational institutions. Academic higher education institutions are a school in which at least one of its organisational units is entitled to award the academic degree of doctor. A vocational higher education institution such as the Academy of Information Technology and Skills Łódź offers first and second cycle study programmes and is not entitled to award the doctor degree.

The degree programmes related to Informatics are accredited by the Polish Accreditation Committee. This means the HEI is supposed to meet the staff- and syllabus-related as well as organisational requirements and has sufficient facilities to carry out the degree programmes in the field of technical sciences. The level of studies is supposed to meet the basic quality criteria both in terms of the didactical approach and scientific work.

The HEI has three faculties, which are the main bodies: computer science (about 1500 students, pedagogy and health (about 500 students), arts and design (about 900 students). There are subdivisions of the Faculty Computer Science which are institutes depending on the programmes offered. Each subdivision has a Vice Dean.

The Academy of Information Technology and Skills Łódź is a non-state (non-public) institution which means they act as a non-profit institution.

The peers also asked for the decision-making structures in the institutions. If the HEI as a whole is concerned the Rector takes any decision. If the Faculty is concerned the Dean takes the decisions whereas all decisions are prepared by the Vice Dean; only the final

decision is with the Dean. The Dean is responsible that his decisions are in line with the ministerial regulations and requirements. The Dean and Vice Dean are appointed by the Rector for four years. The Rector is appointed by the Chancellor who first has to consult the Senate of the institution. The Senate is an elective body of professors. On the Faculty level, there is the Faculty Council as elective body. The Faculty Council is responsible - according to ministerial law - to introduce and validate new specialisations.

The Rector explained the long-term strategy of the HEI. Thus, they aspire to widen their educational offer to foreign and international markets. Some cooperation agreements have been signed such as with the University of Transylvania, in Ukraine and prospectively with Nigeria.

In the course of the on-site visit, the audit team visited lecture halls and laboratories as well as the library. The peers positively recognised the sports facilities on the campus as well as the dormitories for students. They also stressed the HEI's successful strategies to recruit students from abroad. Yet, as mentioned above the peers could not finally assess the adequacy of the laboratory equipment as they do not have yet a clear picture on the assignments students have to do in these laboratories. During the visit of the library the peers got the impression that the access to electronic resources is very limited and the offered range of scientific literature leaves room for improvement. The students confirmed that they do not use literature very often and that they do not have access to electronic books or journals.

Regarding the financing of the programme, the peers wondered how the programmes can be financed properly only with tuition fees. According to the HEI there are no other financial sources (such as state funds) but the Dean confirms that the financing is assured.

Finally, the auditors understood that there is a cooperation agreement with the TU Łódź on the usage of laboratories (e.g. artificial intelligence). The peers asked the HEI to provide them the agreement in order to assess the impact on the programmes and the long-term reliability of the cooperation.

Assessment of the peers:

Criterion 5.3 Institutional environment, financial and physical resources

The peers doubted if the financing of the programme is in fact assured only with tuition fees. However, according to the HEI the tuition fees are sufficient.

It is made clear which collaborations from outside the institution are used for the programme and to train students. Whether the collaboration with the TU Łódź is also sufficient for the purpose and subject to definitive arrangements has to be assessed based on

the requested cooperation agreement. According to the peers the cooperation with the TU Łódź could be of importance for the scientific and academic level of the Master programme.

The organisation and decision-making structures are suited to delivering the training measures even if the peers got the impression that the Dean has comparably much power and the rules of studies sometimes seem to lack clear and objective criteria for certain decisions. Nevertheless, the students were satisfied with the programmes and felt adequately involved in the decision-making process.

Regarding the library, the peers came to the conclusion that the equipment of the library is rather at the lower level, in particular, in terms of electronic access to scientific literature but also the offer of scientific literature on-site. As mentioned above, the peers are of the opinion that it might be sufficient for the Bachelor programme but does not seem adequate for the Master programme. The HEI thus should on a long-term basis improve the students' access to scientific literature.

Regarding the laboratory equipment the auditors judged - subject to the additional information required on the laboratory assignments - that the equipment and facilities available are appropriate for the implementation of the Bachelor program. Regarding the Master programme they have sincere concerns that the technical equipment is adequate for conducting a degree programme at the intended academic level. As far as the peers can assess the equipment at this stage, they got the impression that they are adequate to conduct practical tasks but not application-oriented research projects or scientific work.

B-6 Quality Management: further development of degree programmes

B-6-1 Quality assurance and further development

The self-assessment report provides the following information:

In accordance with the regulations of the Republic of Poland the Academy is obliged to a constant monitoring of the quality of educational services. Precise description of the actions results from the resolutions passed by the Academy of Computer Sciences and Skills Senate.

Currently, the Academy follows the rules of the Internal Educational Quality Management System which was passed on 25 June 2012 by the Resolution of the Academy's Senate.

The supervision is conducted by the National Qualification Framework Representative appointed by the Rector.

Full description of the educational quality process is available in the regulation on the "Internal Educational Quality Management System" of the Academy of Computer Sciences and Skills in Łódź.

According to these regulations the **main elements** of the Quality Assurance System of Educational Services are as follows:

1. Improving the educational quality through a didactic process analysis.
2. Raising the importance of didactic work.
3. Monitoring the academic staff and students' activities in the field of improving the educational quality.
4. The creation of the procedures and defining the criteria and standards of the evaluation of educational quality.

Basic objectives of the Quality System are:

1. Improving the educational quality;
2. Raising the importance of the didactic work;
3. Providing the society with valuable information, especially directed to the secondary school students – candidates, employers and different level authorities concerning the educational quality and the educational level of the graduates, participation in the higher education school rating.

Instruments of the Quality System are:

1. constant monitoring of the academic standards (compatibility with the NQF)
2. evaluation of the educational process (based on documentation)
3. evaluation of the quality and conditions in which the didactic activities are conducted (class inspections)
4. evaluation of the educational conditions (equipment and infrastructure)
5. students evaluation of the didactic classes (anonymous survey)
6. graduates opinion about the studies (anonymous survey)

The Dean sets the timetable of inspections (observations), and the results are documented in the inspection protocol (observation report). Together with the students' questionnaires (available for the students in the Virtual Register and filled in voluntarily) constitutes the basics for the educational quality evaluation.

According to the regulations of the Republic of Poland the HEI is obliged to perform continuous monitoring of quality control of the educational process. Details on the proce-

dures, according to which the quality control is maintained, are the result of the resolutions of the Senate of the University. Currently, the process of implementation of National Qualifications Framework is supervised by the specialist appointed by the Rector of the university. Their role is to monitor and maintain the quality standards compliant with all the necessary requirements.

Analysis of the peers:

The auditors took note of a quality assurance system and understood that the Accreditation Quality Committee is responsible for assurance and development of the quality.

There are two kinds of evaluation:

First, a rather formal one in which the classes/subjects are observed by the programme or subject coordinator. Each subject has such a subject coordinator who is responsible for this course. This person is observing the class, meets the students and collects their opinions. This is happening at least once every two years. After the observation the observation report is completed, signed and provided to the Dean. In case, the observation turned out to be problematic it will be repeated. The coordinator is observed by the Dean. There was also a case where the results of the observation led to consequences for teachers, the contract was not prolonged.

Second, the evaluation is done by the students electronically and anonymously via an online questionnaire. The results will be provided to the Dean or Vice Dean and also to the teacher. In case, the results show a negative picture, further research will be done.

The peers positively recognized the interest in the career path of the graduates by conducting regularly a survey and collecting data on their satisfaction with the programme.

In the discussion with the students the audit team got the impression that feedback loops regarding the electronic evaluation might be more effective. The peers understood that the evaluation takes place mainly at the end of the subject and students do not receive any feedback on the results. Nevertheless, the students stated that conflicts are resolved individually, first with the teacher and if necessary with the Dean. Moreover, there is an elected student council. Finally, every class has a selected spokesman that acts as bridge between the teachers and the students.

Assessment of the peers:

Criterion 6.1 Quality assurance and further development

The peers stated that the HEI has developed and documented an understanding of quality in studies and teaching.

A quality assurance concept is in place. It is regularly further developed, and is designed to ensure the continual improvement of the degree programme. Students and other stakeholders participate to a certain extent in quality assurance activities.

Mechanisms and scopes of responsibility have been determined and regulated which are supposed to ensure the regular further development of degree programmes. However, the peers were not fully convinced that the quality assurance system enables the HEI to ascertain any failure to achieve goals and to draft suitable measures. Finally, the peers come to the conclusion that feedback loops with students could be improved. They therefore recommended to further develop the quality assurance concept and to foresee regular and binding feedback loops with students.

B-6-2 Instruments, methods & data

The HEI provides statistical data on the number of students and graduates for each academic year.

Analysis of the peers:

The peers took note of the statistical data provided. They recognised that these figures do not enable them to analyse the drop-out rate nor the actual study time of the students, which is in particular interesting for the part time mode. Therefore, they asked the HEI to provide this information.

According to the information of the HEI the drop-out rate revolves around 30 per cent for both modes full time and part time. It is interesting to note that most students start the full time and either drop out due to financial reasons or switch to the part time programme.

Students can be enrolled every semester but there is no demand for every semester due to demographic decline.

Assessment of the peers:

Criterion 6.2 Instruments, methods & data

The peers came to the conclusion that suitable methods and instruments are used to ensure that the quality of degree programmes is maintained and further developed.

The data gathered provide information about student employment upon completing their degrees. They make it also possible for those responsible for a programme to recognise weaknesses and correct them.

The missing information requested is supposed to show the extent to which the intended learning outcomes have been achieved by the time the degree is completed. Also still to be assessed is whether they allow conclusions to be drawn as to whether a programme can be successfully completed.

B-7 Documentation and transparency

B-7-1 Relevant regulations

The regulations mentioned below have been provided for assessment:

- The Rules of the Students Internships at the Academy of Computer Science and Skills (put into force)
- Rules of Studies (put into force)

Analysis of the peers:

The peers took note of the regulations made available. They found that these regulations do not provide all information necessary about the admission, course and completion of the degree. Therefore, the peers asked to deliver the Faculty Diploma Regulations, regulations on the recruitment procedure for academic staff as well as the ministerial regulation stipulating the requirements (standard) for the degree programmes.

Assessment of the peers:

Criterion 7.1 Relevant regulations

Subject to the provision of the regulations, the peers assess if the regulations for the programmes encompass all key stipulations for admissions, the operation of the programme and graduation.

B-7-2 Diploma Supplement and qualification certificate

Samples of the Diploma Supplement in English language are annexed to the self-assessment report. In addition to the national grade, an ECTS grading table according to the ECTS Users' Guide is not foreseen.

Analysis of the peers:

The auditors took note of the Diploma Supplement.

Assessment of the peers:

Criterion 7.2 Diploma Supplement and qualification certificate

The peers confirm that issuing an English language Diploma Supplement is mandatory.

The Diploma Supplement allows interested parties to gain insight into the structure, content and level of the successfully completed degree, as well as the individual's performance.

The Diploma Supplement indicates how the final mark was calculated (including weighting of marks) so that outsiders can clearly see how each component was incorporated into the final degree. The Diploma Supplement also provides the grading scheme and explanation of the meaning of each grade. In the opinion of the peers this enables the reader to interpret Polish grades.

The peers could, however, not find any information or statistical data in addition to the final mark to assist in interpreting the individual grade. Therefore, they consider it necessary to provide such data in accordance with the ECTS User Guide.

C Additional Information

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

1. complete set of subject descriptions ("module handbook") for both degree programmes including all relevant aspects
2. visual overview of the curricula of both programmes Bachelor and Master divided by the offered specialisations
3. intended objectives of the programmes differentiated by the specialisation for both programmes
4. table referencing the learning outcomes for the field of technical sciences to the learning outcomes of the programme for the Master programme
5. ministerial regulation stipulating the requirements (standard) for the degree programmes
6. list of the academic staff for both programmes stipulating the total teaching hours
7. information on the academic staff including professional expertise, publications, research projects
8. cooperation agreements with TU Łódź on the usage of laboratory (e.g. artificial intelligence)
9. description of laboratory assignments (e.g. network security)
10. Faculty Diploma Regulations (exam regulations for the bachelor and the master degree programme)
11. regulations on the recruitment procedure for academic staff
12. explanation for each relevant module why the given credit points for full time and part time are different in the same module (e.g. operation systems, operating systems administration, basics of electronics)
13. drop-out rates
14. data on the actual study time of the students for part time mode

D Comment of the HEI (09 January 2014)

The institution provided the following statement:

B-2-2. Learning outcomes and programme

General learning outcomes and skills gained by the students of both cycles of studies have been presented in the description of the Graduate Profile. They are available for applicants, the students and anyone interested on the University website. Detailed description of the studies curriculum and course descriptions (syllabi) are available for the students after logging into the system (via the Virtual Register Application). Currently, the works are carried on the modification of the University website, so that this information is commonly available to anyone interested.

According to the demand on the labour market and the expectations of the students, the program of study/study curriculum at the University of Computer Sciences and Skills puts great emphasis on providing knowledge and practical skills to apply theoretical knowledge in solving engineering problems. In addition, the students of the 2nd cycle studies (MSc) participating in scientific conferences (both external and organized by the University of Computer Science and Skills) and collaborating with the University employees in their research work (preparing the research environments, creating software for data collection and analysis, writing simulators – often as their master's theses) are preparing to treat Computer Science as a scientific field.

B-2-5. Admissions and entry requirements

For several years the University's possibilities of new students admission to both cycles of studies have exceed the number of applicants and for this reason there was no need to develop criteria for selection and rejection of applicants. The law does not allow universities to organize the tests and examinations in order to verify the knowledge and skills of the candidates – the admission to the 1st cycle studies is possible for persons who passed their secondary school final examination and admission to the 2nd cycle studies is possible for the persons who completed 1st cycle studies. Verification of students' knowledge and skills occurs within a course of study through a system of colloquia, examinations and tests. The students of the 2nd cycle studies who completed the 1st cycle studies in the faculties other than engineering, attend the additional semester allowing the students to gain the required level of knowledge necessary to obtain the projected learning outcomes.

B-2-6 Curriculum/content

In reference to the comments of the Accreditation Committee, the missing descriptions of subjects for the 1st and 2nd cycle studies have been sent. In the descriptions, the incorrectly stated amounts of ECTS points have been revised (the subject is assigned the same amount of ECTS points (one ECTS point corresponds to the learning outcomes obtained in 25-30 hours of student work) both in full-time and part-time studies – differences in the number of hours of lectures and laboratory classes planned for part-time studies are complemented by the increased number of student's self-study hours, increased number of the teacher's office hours, and extra possibility for the students to contact academic teachers via electronic media.)

The courses conducted in the framework of the studies are designed to provide students with both practical and theoretical knowledge and skills. The courses have been tailored to skills and knowledge of the average student. Some courses in the 2nd cycle studies allow the students who have completed the 1st cycle studies in another field to get the knowledge to understand the discussed issues. Referring to the objections of the Committee to selected courses in the 2nd cycle studies, some of the objections stem from insufficient description of the course contents in the syllabi. e.g.:

- 'Management of Network Infrastructure' course requires from the students programming skills, knowledge of network protocols and in-depth understanding of the technologies used to manage the network. Within the course, the students create applications for managing the network – NSMP clients as well as managing applications running under control of a particular operating system.
- Within the framework of the 'Monitoring and computer network analysis' course (scheduled in the 3rd semester of study because it requires in-depth knowledge of the network technologies and protocols) the students analyse network data and gain the ability to draw conclusions in order to optimise the network environment. This requires not only knowledge of network protocols, but also the algorithms on which they are based, for example for the STP protocol to be analysed properly the knowledge of algorithms for the Minimal Spanning Tree is required and for routing protocols the knowledge of Dijkstra's and Bellman-Ford algorithms is required. Within the framework of this course the students write an application enabling the simulation of network communication.

B-3-3 Educational methods

Following the comments of the Committee on the types of classes and the suggestion to introduce more seminars, we would like to emphasize that in addition to diploma seminars a significant part of the laboratory classes involves the implementation of projects by students. In these classes, the students propose solutions which are analysed in the discussion moderated by the teacher conducting the class.

B-4. Examinations: system, concept and organisation

The quality of master's theses written by the students of the 2nd cycle studies is ensured by an adequate system of organization of the topic declaration, the supervision over the thesis implementation, its review and evaluation. The topics of the diploma thesis are selected and declared by the University employees (holding the scientific degree not lower than a PHD) and accepted by the Faculty Council of the University of Computer Sciences and Skills. The thesis is written under the supervisor’s control and reported by a student at the diploma seminars. Upon the thesis completion it gets evaluated by the supervisor and the reviewer (one of the mentioned persons has to hold a scientific degree of a Habilitated Doctor). The condition for the thesis to be admitted to the defence examination is a positive evaluation of the thesis by both the supervisor and the reviewer. Moreover, each thesis is verified by the ati-plagiarism program recommended by the Ministry. Thesis with Distinction are published in the scientific journal issued by the University. Some diploma thesis are created within the framework of scientific cooperation between the students and the University employees on their scientific research projects.

B-5-3 Institutional environment, financial and physical resources

In reference to comments of the Committee on doubts concerning the University’s laboratory possibilities allowing the students to perform the tasks at the appropriate level of research we would like to emphasize the additional possibility for students of using the computing power and applications (e.g. Matlab) provided under a contract signed by the school within the programme shared by the Computer Centre of the Technical University of Lodz.

B-6-2 Instruments, methods & data

In view of the doubts of the Committee on ways of verification of the of the students’ skills’ suitability in their future careers, there is a system monitoring the graduates. Monitoring of Professional Careers of the Graduates of the University of Computer Sciences and Skills includes graduates of all faculties, full-time and part-time studies, 1st and 2nd cycle studies starting with the graduates of the year 2011/2012. The monitoring covers the students of the University of Computer Sciences and Skills situated in Łódź as well as

the students of its branches (Opatówek, Włocławek and Bydgoszcz). The aim of the study is to verify the quality and effectiveness of education at the University on the basis of the information gained from the graduates of the University over a few years after their graduation. The collected data allows to adjust educational programs of the University to the students' expectations and requirements of the labour market. Monitoring is anonymous and is divided into four stages. The first of the stages is filling out the questionnaire at the University Career Office (BAZa). A preliminary questionnaire allows to collect information on the employment status of the graduates and their expectations towards the employment sector. The second stage starts a year after the graduation. The questionnaire is sent to the graduate and on its basis the University Career Office (ABK BAZa) gathers the information concerning the graduate's current situation (where he/she is employed, in what sector , how the Graduate assesses the suitability of the knowledge gained at the University for the labour market, if he/she continues his education and what tools for job searching he/she is using). The third and fourth stage are planned respectively in 3 and 5 years after the graduation. In the assumptions, monitoring is to help to increase the knowledge on the of graduates' situation on the labour market.

E Final Assessment of the peers (27.02.2014)

The peers find the **additional information** provided by the institution suitable to come to a final assessment.

Taking into account the additional information and the comments given by HEI the peers summarize their analysis and **final assessment** as follows:

Criterion 2.1 Objectives of the programmes; Criterion 2.2 Learning Outcomes of the programmes

The peers take note of the provided graduation profile for the Bachelor as well as for the Master programme. The objectives and learning outcomes are now specified for each of the offered specializations. On the website of the HEI a graduation profile, i.e. the learning outcomes, seem to be available in Polish. According to the website, even more than three specializations for the Bachelor as well as the Master programme are described, although the HEI stated that these are not offered in fact. Therefore, the peers only assessed the offered specializations.

Moreover, the peers refered to the provided matrix of correlation between educational outcomes/effects in the field of technical sciences (e.g. T2A_W01) and education effects for the main field of study. The peers wonder why the table refers to main field of study "Power Engineering" and to what extent this is relevant for the Master Informatics. They assume as Power Engineering is a technical subject they are also valid for the Master Informatics.

The peers confirm that the objectives and learning outcomes are summarized and accessible to the relevant stakeholders. Thus, the originally intended requirement is fulfilled and therefore not necessary anymore.

The peers also confirm their assessment regarding the learning outcomes as such considering the relevant qualification framework and the ASIIN Subject-Specific Criteria (see page 10f.). But they state that the fulfilment of the criteria is near to the minimum that has to be expected.

Criterion 2.3 Learning Outcomes of the modules/module objectives

For the final assessment, the peers took into consideration the full set of module descriptions as well as the objective matrix for the Bachelor and the Master which were provided together with the comments of the HEI.

Based on the provided documents the peers came to the conclusion that the intended learning outcomes for the programme as a whole are systematically put into practice within the individual modules of the programme.

However, the module descriptions are still not available for relevant stakeholders – particularly students and lecturers – for consultation. Therefore, the peers confirm their assessment (see p. 13) that these need to be made available and adhere to their originally intended requirement.

Criterion 2.5 Admission and entry requirements

The peers cannot completely follow the comments regarding criterion 2.5 provided by the HEI (see chapter D). Even though the number of places is higher than the number of applicants, the peers see the need for the Master programme to develop entry requirements and criteria in order to facilitate the achievement of the learning outcomes also at the intended academic level. It does not hinder the HEI to implement rules that enable flexibility in the admission for those who fall short of some admission or entry requirements as described in the comments of the HEI. The peers can also not follow the comments of the HEI as the provided Law on Higher Education depicts in different articles another situation. For example, Article 6 states “A higher education institution shall have in particular the right to define the conditions of admission to degree programmes, including the number of places available for students, except in medical fields of study.” Article 62 says the following: “The senate of a higher education institution shall have the following powers to […] adopting […] the rules for admission to degree programmes and doctoral programmes”. According to the peers, even a test or examination is possible. Article 164 states: “[…] Knowledge or skills examinations held for admission to degree programmes may also be conducted, and final theses may also be prepared, in a foreign language.” finally, the peers saw that Article 169 allows other admission requirements than only the degree of first cycle programme: “Access to degree programmes in a higher education institution is open to persons who: 1) hold a secondary-school leaving certificate, if applying for admission to a first-cycle programme or a long-cycle programme, or 2) hold the degree of magister, licencjat, inynier or an equivalent degree and fulfil the requirements laid down on the basis of section 2, if applying for admission to a second-cycle programme, and fulfil admission conditions defined by a given higher education institution.” The HEI is also allowed to implement an admission committee in case where

admission to degree programmes is subject to fulfilment of additional conditions. Student enrolment shall according to the law be carried out by admissions committees appointed by the head of a given organisational unit or other body indicated in the statutes. Admissions committees shall decide matters related to student enrolment. Taking these regulations into account the peers do not see reasons why the HEI does not develop subject-specific competences that are to be fulfilled in order to ensure the learning outcomes. The peers confirm their assessment (p. 16) and come to the conclusion that the current admission procedure contradicts the achievement of a degree at the academic and scientific level intended for the Master programme.

Criterion 2.6 Curriculum

The peers welcome the graphical overview of the curricula for each offered specialization of the Bachelor and the Master programme. For their final assessment they also consider the complete set of module descriptions. The HEI has not provided any description of laboratory assignments.

Based on the provided information the peers confirm their preliminary assessment regarding the Bachelor programme (p. 38f.).

Regarding the Master programme the module descriptions offered for the master programme did not meet the expectations of the peers. The specified learning outcomes and enumerated contents are not presented on a level expected for master lecture. According to the peers graduates will not be able to achieve the expected qualification level, amongst others because of the lack of theoretical and methodological foundations of the discipline.

Criterion 3.2 Workload and credit points

The HEI has provided data on the actual study time of the students. However, it does not distinguish between part time and full time students. Therefore, the peers cannot withdraw any conclusion if the study plans as suggested for part time students can be finished in the standard period of study. The peers consider that students will not be able to achieve the same qualification as full-time students in the standard period of study, given that their curriculum encompasses a significantly lower number of contact hours. There are no information regarding student workload, organization and advice of students that would support that the part time mode is at the level of a Bachelor's degree programme

compared to level 6 of the EQF. Therefore the peers suggest to only accredit the full time mode.

Criterion 4 Examinations

The peers took note of the provided Faculty Diploma Regulations. They consider these regulations suitable for conducting a transparent exam procedure. The regulations also contain rules on the final thesis which are in fact convincing and appropriate in order to write a final thesis on the intended academic and scientific level. Nevertheless, the theses for the Master programme presented during the on-site visit led to a different assessment. The peers doubt that the final thesis presented shows that students can carry out an assigned task independently and at the level of the qualification sought. Also the limited access to scientific literature does not support to meet the academic objective and requirements the Master programme does have. The peers also have the impression that the final thesis is not at such an academic level as it could prepare for a PhD programme.

Criterion 5.3 Institutional environment, financial and physical resources

The peers take note of the fact that the Academy is member of the project "Information Platform TEWI" (Technology, Education and Research, Knowledge, Innovation). The platform is supposed to facilitate cooperation between the universities and industry by utilizing compatible software and laboratory. Even though the Academy does in fact not provide a signed cooperation agreement with the Technological University Lodz which states that the Academy can utilize the laboratories of the University, the peers see the participation in the platform as sufficient evidence for such a kind of cooperation. The HEI has not provided any description of laboratory assignments. Thus, the peers cannot assess finally the practical application in the Bachelor programme. As described, the peers perceived the task in the laboratories as very low academic level. The peers consider it necessary to have an additional requirement which ensures that the laboratory assignments are at the academic level sought for a Bachelor programme.

With regard to the teaching capacity, the peers see that 11 professors have a teaching load of 920 hours. The teaching load ranges between 30 and 160 hours for each of the professor. The other academic staff (25 teachers) has a total teaching load of 4,230 hours per year ranging between 90 and 240 hours per person. The peers consider the total teaching hours that also include supervising theses, administration, preparing lectures are sufficient for teaching and student supervision. The list of teachers sent with the statement of the university is congruent with the list sent together with the self-assessment

report. Moreover, the HEI delivered a list of scientific publications of the academic staff of the Department of Computer Science and Management for the years 2006 -2012. Two issues are, however, not solved yet. Firstly, it is still not clear which role and task the teachers have that were present during the on-site visit but are not mentioned in the list of academic staff. Moreover, the peers do not have any information on the professional expertise of each teacher, nor their engagement in relevant research projects within the last five years. As the peers cannot come to a final assessment, they consider it necessary to have an additional requirement: the composition and (specialist) training of the teaching body ensures that the intended learning outcomes are achieved by the time the degree is completed.

The additional information and comments from the institution entail no further changes to the assessment of the peers.

Summary of the final assessment

The peers recommend the award of the seals as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific labels**[1]	**Maximum duration of accreditation**
Ba Informatics (full time mode)	With requirements	n.a.	30.09.2019
Ba Informatics (part time mode)	Refusal	n.a.	--
Ma Informatics	Refusal	n.a.	--

Requirements and recommendations for the different seals:

Requirements	**ASIIN criteria**
For the Bachelor degree programme (full time mode)	
1. The module descriptions have to be available for relevant stakeholders – particularly students and lecturers – for consultation, and provide a basis for the further development of the modules.	2.3
2. One credit point has to be appropriately represented with 25–30 h workload including the work done by students (presence time and self-study	3.2

[1] Auflagen / Empfehlungen und Fristen für Fachlabel korrespondieren immer mit denen für das ASIIN-Siegel.

time). All compulsory components of the programme have to be included. The allocation of credit points to modules has to be transparent and comprehensive.	
3. The programme has to consist of modules considering a module as a coherent and consistent package of teaching and learning in itself.	3.1
4. In addition to the final mark, statistical data need to be provided in accordance with the ECTS User Guide to assist in interpreting the individual grade.	7.2
5. It has to be ensured that the laboratory assignments are at the academic level sought for the programme.	2.6
6. The composition of the teaching body has to ensure that the intended learning outcomes are achieved by the time the degree is completed.	5.1

Recommendations	**ASIIN criteria**
For the Bachelor degree programmes (full time mode)	
1. It is recommended to improve the students' access to scientific literature.	5.3
2. It is recommended further developing the quality assurance concept. In this context, feedback loops with students have to be improved.	6.1 6.2
3. It is recommended to encourage the students to go abroad for one semester or year.	3.1 3.4
4. It is recommended to integrate the educational method "seminar".	3.3
5. It is recommended to enable graduates of this programme to further develop their competences (also in a life-long-learning approach) and to adapt to new developments in the disciplines, concentrating on basic concepts and theoretical and methodological foundations as well as on practical application.	2.6
6. It is recommended, for reaching the intended CEF language level B2 at the end of the 4th semester for the Bachelor students to intensify language teaching in small learning groups, motivate free speaking as well as talking to one another as well as to a mother-tongue teacher. It is further	2.6

recommended to ensure that students are ensured sufficient self study time on top of the tutorial presence.

F Comments of the Technical Committee 04 – Informatics/Computer Science (06 March 2014)

The Technical Committee discusses the procedure.

The Technical Committee agrees with the requirements and recommendations of the peers.

For the award of the ASIIN seal:

The Technical Committee fully agrees with the requirements and recommendations proposed by the peers.

The Technical Committee 04 – Informatics/Computer Science recommends the award of the seal as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific labels**	**Maximum duration of accreditation**
Ba Informatics (full time mode)	With requirements	n.a.	30.09.2019
Ba Informatics (part time mode)	Refusal	n.a.	--
Ma Informatics	Refusal	n.a.	--

G Decision of the Accreditation Commission (28 March 2014)

The Accreditation Commission discusses the procedure.

Regarding the Bachelor's degree programme Informatics the Accreditation Commission adopts minor editorial amendments. When assessing the documents the Commission states that there is no specific reference made by the regulations presented to the qualifications or competences to be recognized. Along the Lisbon Convention each university is asked to recognize activities completed externally unless the HEI can prove that the competences gained at the other HEI are completely different. Thus rendering these provisions not fully in accordance with the correspondent rules of recognition in the Lisbon Convention (see in particular: Section III "Convention on the Recognition of Qualifications concerning Higher Education in the European Union"). In principle, such regulations are meant to encourage and support the mobility of students as a pivotal part of this Convention. The Accreditation Commission adds a requirement concerning this matter.

Regarding the Master's degree programme Informatics the Accreditation Committee considers the degree programme as not at the level of a Master's degree programme compared to level 7 of the European Qualifications Framework (EQF). The learning outcomes are not on the level according to the EQF and seem not to be achieved on the intended level. The Accreditation Commission considers that the Master's degree programme does not prepare for the PhD. Furthermore the technical equipments are not adequate for conducting a Master's degree programme. The Accreditation Commission considers that adopting the Master's degree programme to level 7 of the EQF is not possible within 18 months.

Regarding the Bachelor's degree programme Informatics (part time mode) the Accreditation Commission considers that students will not be able to achieve the same qualification as full-time students in the standard period of study, given that their curriculum encompasses a significantly lower number of contact hours. There are no information regarding student workload, organization and advice of students that would support that the part time mode is at the level of a Bachelor's degree programme compared to level 6 of the EQF.

Therefore the Accreditation Commission refuses the accreditation of the Master's degree programme Informatics and the Bachelor's degree programme Informatics (part time mode).

The Accreditation Commission for Study Programmes decides on the award of the requested seal as described hereafter:

Degree Programme	ASIIN-seal	Subject-specific labels	Maximum duration of accreditation
Ba Informatics (full time mode)	With requirements	n.a.	30.09.2019
Ba Informatics (part time mode)	Refusal	n.a.	--
Ma Informatics	Refusal	n.a.	--

For the Bachelor degree programme (full time mode)

Requirements

A 1. (ASIIN 2.3) The module descriptions have to be available for relevant stakeholders – particularly students and lecturers – for consultation, and provide a basis for the further development of the modules.

A 2. (ASIIN 3.2) One credit point has to be appropriately represented with 25–30 h workload including the work done by students (presence time and self-study time). All compulsory components of the programme have to be included. The allocation of credit points to modules has to be transparent and comprehensive.

A 3. (ASIIN 3.1) The programme has to consist of modules considering a module as a coherent and consistent package of teaching and learning.

A 4. (ASIIN 7.2) In addition to the final mark, statistical data needs to be provided in accordance with the ECTS User Guide to assist in interpreting the individual grade.

A 5. (ASIIN 2.6) It has to be ensured that the laboratory assignments are at the academic level sought for the programme.

A 6. (ASIIN 5.1) It has to be shown that the qualification and scope of the teaching staff is adequate to the intended learning outcomes.

A 7. (ASIIN 2.5) With view to internationalization and, in particular, the mobility of students rules for the recognition of activities completed at other (national and foreign) HEIs have to be adopted (“Lisbon Convention”).

Recommendations

E 1. (ASIIN 5.3) It is recommended to improve the students' access to scientific literature.

E 2. (ASIIN 6.1, 6.2) It is recommended further developing the quality assurance concept. In this context, feedback loops with students have to be improved.

E 3. (ASIIN 3.1, 3.4) It is recommended to encourage the students to go abroad for one semester or year.

E 4. (ASIIN 3.3) It is recommended to integrate the educational method "seminar".

E 5. (ASIIN 2.6) It is recommended to enable graduates of this programme to further develop their competences (also in a life-long-learning approach) and to adapt to new developments in the disciplines, concentrating on basic concepts and theoretical and methodological foundations as well as on practical application.

E 6. (ASIIN 2.6) It is recommended, for reaching the intended CEF language level B2 at the end of the 4th semester for the Bachelor students to intensify language teaching in small learning groups, motivate free speaking as well as talking to one another as well as to a mother-tongue teacher. It is further recommended to ensure that students are ensured sufficient self study time on top of the tutorial presence.