



Evaluation Report

University of Ljubljana

University Study Programme Computer and Information Science

Professional Study Programme Computer and Information Science

Master Study Programme Computer and Information Science

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Abbreviations:

ASIIN = Agency implementing the present evaluation procedure

E = Exercises

FRI = Faculty of Computer and Information Science

HEI = Higher Education Institution

HSW = Hours of student work

L = Lectures

MS programme = Master Study Programme Computer and Information Science

PROF programme = Professional Study Programme Computer and Information Science

SER = Self Evaluation Report (used identical with "Self-Assessment-Report")

SSC = ASIIN Subject-specific Criteria

UL = University of Ljubljana

UNI programme = University Study Programme Computer and Information Science

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

A About the Evaluation Process

Evaluation subject	University of Ljubljana University Study Programme Computer and Information Science Professional Study Programme Computer and Information Science Master Study Programme Computer and Information Science	
Experts	Prof. Dr. rer. nat. Hans-Ulrich Hei, Technical University Berlin Prof. Dr. Bettina Harriehausen-Mhlbauer, University of Applied Sciences Darmstadt	
Representative of ASIIN Headquarter	Marie-Isabel Zirpel	
Timeline	Date	Milestone
	17/10/2014	Submission of the final version of the self-assessment report
	18-19/11/2014	Date of the onsite visit
	23/02/2015	Submission of the draft of the evaluation report Feedback on the draft of the evaluation report Submission of the finalised version of the evaluation report
Relevant criteria	ASIIN General Criteria for the Accreditation of Degree Programmes (28/06/12) used as reference for the assessment http://www.asiin-ev.de/media/ASIIN_General_Criteria_for_the_Accrediation_of_Degree_Programmes_2012-06-28.pdf Subject-Specific Criteria Relating to the accreditation of Bachelor’s and Master’s degree programmes in informatics (09/12/11) used as reference for the assessment http://www.asiin-ev.de/media/feh/ASIIN_TC_04_Informatics_2011-12-09.pdf Standards and Guidelines for Quality Assurance in the European Higher Education Area (2009) http://www.enqa.eu/wp-content/uploads/2013/06/ESG_3edition-2.pdf	

Preliminary Remark

In the framework of project KUL, ASIIN conducted an evaluation of the degree programmes *University Study Programme Computer and Information Science*, *Professional Study Programme Computer and Information Science* and *Master Study Programme Computer and Information Science* at the UL Faculty of Computer and Information Science in November 2014, leading to the following report.

ASIIN considers evaluations as an instrument for organizational development triggered by a two staged process of an internal self assessment followed by an independent third party assessment by external peers. In the first stage members of the evaluated organisation are asked to implement an internal self-reflection process including relevant stakeholders leading to a self evaluation report (SER). This report states a shared internal understanding or at least the overview on internal views of/on strengths and weaknesses of the evaluated subject. ASIIN then combines an audit team representing suitable expertise concerning the evaluated subject, independency and a good match of the different stakeholder-perspectives engaged with or affected by the evaluated subject. This team reviews the SER, including evidences, and conducts a site visit at the institution, where the SER is validated in discussions with the relevant stakeholders. The findings are compiled in an evaluation report stating strengths and weaknesses from the external view and recommendations towards their enhancement.

The evaluation report and the site visit are structured with the help of a pre-defined and agreed catalogue of evaluation criteria. It refers to (I) objectives, content and implementation of the degree programmes, (II) their structure, method and implementation, (III) concept and organisation of examinations (IV) resources and (V) documentation and transparency.

The further report proceeds as follows: In chapter B the fact-finding is reported on which the assessment of the peers is based. The information principally stems from the self-assessment report and related appendices provided by the Higher Education Institution. The following chapters include the assessment results of the peers about compliance with the evaluation criteria.

B Characteristics of the Degree Programmes

a) Name & Final Degree	c) Mode of Study	d) Duration & Credit Points	e) First time of offer & Intake rhythm	f) Number of students per intake	g) Fees
University Study Programme Computer and Information Science Bachelor of Science in Computer Science and Informatics	Full time	6 Semester 180 CP	2008 October 1 st	165 students	none
Professional Study Programme Computer and Information Science Bachelor of Applied Science in Computer Science and Informatics	Full time	6 Semester 180 CP	2008 October 1 st	165 students	none
Master Study Programme Computer and Information Science Master of Science in Computer Science and Informatics	Full time	4 Semester 120 CP	2011 October 1 st	75 students	none

For the UNI programme the following **intended learning outcomes** are reported:

General skills acquired in the programme

- Developing skills in critical, analytical and synthetic thinking;
- The ability to define, understand and solve creative professional challenges in computer and information science;
- The ability to transfer knowledge and professional communication skills and writing skills in the native language as well as a foreign language;
- The ability to search for resources and critically analyse information;
- Compliance with safety, functional, economic and environmental protection principles;
- The ability to apply acquired knowledge in independent work for solving technical and scientific problems in computer and information science; the ability to upgrade acquired knowledge;
- Team work skills with other experts in the field;
- The development of professional responsibility and ethics.

Specific skills acquired in the programme

- Basic skills in computer and information science, which includes basic theoretical skills, practical knowledge and skills essential for the field of computer and information science;
- The ability to understand and apply computer and information science knowledge to other technical and relevant fields (economics, organisational science, etc.);

- Practical knowledge and skills in the use of software, hardware and information technologies, which are a necessary part of a successful professional's work;
- First cycle graduates are able to independently perform less demanding and complex engineering and organisational tasks in their areas and independently solve specific well-defined tasks in computer and information science;
- Basic skills in computer and information science, allowing the continuation of studies in the second study cycle.

The following **curriculum** is presented:

Year 1	Winter					Summer					Total	
	L*	E**	Lab	ECTS	HSW***	L	E	Lab	ECTS	HSW	ECTS	HSW
Programming 1	3	0	2	6	180	0	0	0	0	0	6	180
Calculus	3	1	1	6	180	0	0	0	0	0	6	180
Discrete Structures	3	1	1	6	180	0	0	0	0	0	6	180
Introduction to Digital Circuits	3	0	2	6	180	0	0	0	0	0	6	180
Physics	3	2	0	6	180	0	0	0	0	0	6	180
Programming 2	0	0	0	0	0	3	0	2	6	180	6	180
Linear Algebra	0	0	0	0	0	3	0	2	6	180	6	180
Fundamentals of Databases	0	0	0	0	0	3	0	2	6	180	6	180
Computer Communications	0	0	0	0	0	3	0	2	6	180	6	180
Human-Computer Interaction	0	0	0	0	0	3	0	2	6	180	6	180
Total	15	4	6	30	900	15	0	10	30	900	60	1800
Total hours per semester	225	60	90			225	0	150				

Year 2	Winter					Summer					Total	
	L	E	Lab	ECTS	HSW	L	E	Lab	ECTS	HSW	ECTS	HSW
Course												
Algorithms and Data Structures 1	3	0	2	6	180	0	0	0	0	0	6	180
Computer Systems Architecture	3	0	2	6	180	0	0	0	0	0	6	180
Probability and Statistics	3	0	2	6	180	0	0	0	0	0	6	180
Operating Systems	3	0	2	6	180	0	0	0	0	0	6	180
Introduction to Information Systems	3	0	2	6	180	0	0	0	0	0	6	180
Theory of Information and Systems	0	0	0	0	0	3	0	2	6	180	6	180
Algorithms and Data Structures 2	0	0	0	0	0	3	0	2	6	180	6	180
Computer Systems Organization	0	0	0	0	0	3	0	2	6	180	6	180
General elective courses	0	0	0	0	0	3	2	0	6	180	6	180
Specialist elective courses (Table 2)	0	0	0	0	0	3	0	2	6	180	6	180
Total	15	0	10	30	900	15	2	8	30	900	60	1800
Total hours per semester	225	0	150			225	30	120				

Year 3	Winter					Summer					Total	
	L	E	Lab	ECTS	HSW	L	E	Lab	ECTS	HSW	ECTS	HSW
Course												
Introduction to Artificial Intelligence	3	0	2	6	180	0	0	0	0	0	6	180
Module elective course I (table 3)	3	0	2	6	180	0	0	0	0	0	6	180

Module elective course I (table 3)	3	0	2	6	180	0	0	0	0	0	6	180
Module elective course II (table 3)	3	0	2	6	180	0	0	0	0	0	6	180
Module elective course II (table 3)	3	0	2	6	180	0	0	0	0	0	6	180
Economics and Entrepreneurship	0	0	0	0	0	3	2	0	6	180	6	180
Module elective course I (table 3)	0	0	0	0	0	3	0	2	6	180	6	180
Module elective course II (table 3)	0	0	0	0	0	3	0	2	6	180	6	180
General elective course	0	0	0	0	0	3	2	0	6	180	6	180
Diploma seminar	0	0	0	0	0	3	0	1	6	180	6	180
Total	15	0	10	30	900	15	4	5	30	900	60	1800
Total hours per semester	225	0	150			225	60	755				

Specialist elective courses: Mathematical Modelling, Principles of Programming Languages, Computer Technologies

Module elective courses: Information Systems, Management of Information Systems, Software Engineering, Computer Networks, Computer Systems, Algorithms and System Utilities, Artificial Intelligence, Multimedia

General elective courses: English level A, B, C, Topics in Computer and Information Science, Computer Science in Practice I and II, Algorithm Implementation.

For the Prof programme the following **learning outcomes** are **intended** to be achieved by graduates:

General skills acquired in the programme:

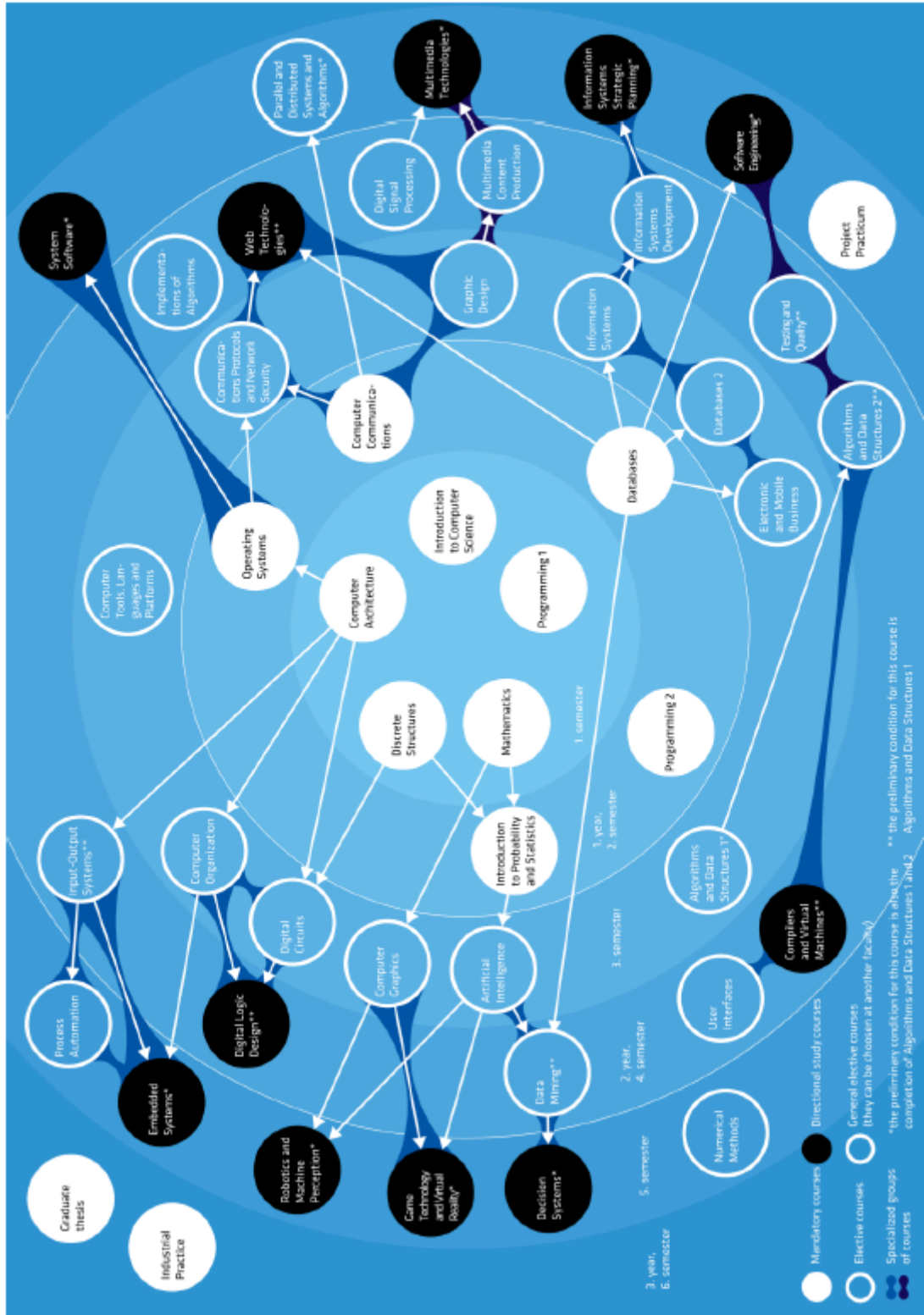
- Developing skills in critical, analytical and synthetic thinking;
- The ability to define, understand and solve creative professional challenges in computer and information science;
- The ability to transfer knowledge and professional communication and writing skills in the native language as well as a foreign language;
- The ability to search for resources and critically analyse information;

-
- Compliance with safety, functional, economic and environmental protection principles;
 - The ability to apply acquired knowledge in independent work for solving technical and scientific problems in computer and information science; the ability to upgrade acquired knowledge;
 - Team work skills with other experts in the field.

Specific skills acquired in the programme:

- Basic skills in computer and information science, which include basic theoretical skills, practical knowledge and skills essential for the field of computer and information science;
- The ability to understand and apply computer and information science knowledge to other technical and relevant fields (economics, organisational science, etc.);
- Practical knowledge and skills in the use of software, hardware and information technologies, which are a necessary part of a successful professional's work;
- The ability to independently perform both less demanding and complex engineering and organisational tasks in certain narrow areas and independently solve specific well-defined tasks in computer and information science;
- Basic skills in computer and information science, which with completing the differential exams allow the continuation of studies in the second study cycle.

The following **curriculum** is presented:



For the MS programme, the description of the programme states the following **intended learning outcomes**:

General competences acquired through the programme

- Development of critical, analytic and synthetic thinking.
- The ability to define, understand and creatively respond to professional challenges in the field of computer and information science.
- The ability to use the acquired knowledge for solving professional and scientific problems and to extend the acquired knowledge.
- Proficiency in research methods in the field of computer science.
- The ability for administrative management of processes related to research, industry, education and other fields.
- The ability of professional written communication in the field of computer and information science both in Slovene and English.
- The ability to transmit knowledge.
- The ability to search knowledge sources and critically evaluate information.
- Compliance with security, functional, economic and environmental principles.
- The ability of team work within the professional environment.
- Development of professional responsibility and ethics.

Subject-specific competences acquired through the programme

- Basic competences in the field of computer and information science, which include theoretical knowledge, practical knowledge and skills essential for work in the field of computer and information science.
- Detailed understanding of computer and information science and the ability to apply the acquired knowledge to technical and other relevant professional fields (economy, organizational sciences, etc.).
- The ability to transmit knowledge to co-workers in technology and research groups.
- Practical knowledge and skills of computer hardware, software and information technology necessary for successful professional work in computer and information science.
- Graduates in the 2nd cycle of the study programme have the competence to independently tackle demanding developmental, engineering, and organisational tasks as well as moderately demanding research tasks in their fields of study.
- Competences in computer and information science granting access to further study at 3rd cycle doctoral programmes.

The following **curriculum** is presented:

Semester 1: Mathematics 2, Programming, specialist elective, general elective

Semester 2: Algorithm, Computer systems, specialist elective, general elective

Semester 3: Specialist elective, Master's thesis

Semester 4: Specialist elective, Master's thesis

Specialist elective courses: Artificial intelligence, Wireless Sensors Networks, Unconventional Computing, Perception in Cognitive Systems, Biomedical Signal and Image Processing, Modern Software Development Methods, Digital Signal Processing, Computability and Computational Complexity, E-learning, Machine Learning, Introduction to Bioinformatics, Information Security and Privacy, Numerical Mathematics, Computer Based Sound Production, Data Mining, IT Governance, Interaction and Information Design, Cryptography and Computer Security, Digital Forensic, Contemporary Approaches and Architectures in IS Development, Discrete Mathematics, Operations management, Cloud Computing, Computational Topology, Computer-based Process Control, Research Seminar, Topical research themes I and II, Teaching Algorithmic Thinking

General elective courses: Extracurricular professional activity I and II, Topics in Computer and Information Sciences, Data mining and visualization.

C Findings of the Peers

I. Degree Programmes: objectives, content and implementation

Evaluation Criterion I.1: Objectives of the degree programme

Evaluation question: How is the final degree to be classified in academic and professional terms?

Analysis and findings of the peers

With regard to the stated objectives of the degree programmes, the panel noted that UL FRI has classified the two first cycle degree programmes UNI and Prof as Bachelor study programmes at university level. The UNI programme is meant to provide graduates with all necessary competences to solve professional problems and work in teams and prepares for continuation of studies at the Master's level. The Prof programme is by contrast designed as applied and engineering oriented programme typically meant to be a conclusion of academic education directly leading into professional career paths. The MS programme is classified as a Master study programme. It enables graduates of the first cycle programmes to broaden and extend their knowledge. The study programme provides graduates with the knowledge necessary to follow technological changes and development, join developmental and scientific work, or continue study at doctoral level. The experts came to the conclusion that the stated objectives correspond to the qualifications of the European Qualifications Framework level 6 and 7 respectively. Altogether, they had the impression that the university has duly classified the final degrees in academic and professional terms.

Strengths and weaknesses

No specific strengths and weaknesses are derived from this chapter.

Evaluation Criterion I.2: Learning outcomes of the programme

Evaluation questions:

Have the objectives of the programme been described as learning outcomes to be acquired by the learners on the level of the course/module/programme respectively?

Are these learning outcomes

- 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?
- reflecting the level of the qualification sought?
- comparable to the exemplary learning outcomes set out in the appropriate ASIIN Subject-specific Criteria?
- achievable, valid, and reflecting currently foreseeable scientific trends in the subject area?

Does the name of the programmes reflect the intended learning outcomes?

Analysis and findings of the peers

The experts separately discussed the learning outcomes of each degree programme. The intended learning outcomes were used furthermore as a central reference for the evaluation of the programmes' curricula and resources by questioning if the latter would properly support the achievement of the learning outcomes declared.

They took note that the learning outcomes of the degree programmes offered by the university are published, clearly arranged and understandable from the detailed descriptions of the programmes on the university's homepage. They are accessible to students, lecturers and prospective students in a way that they are able to refer to them for example in the scope of the internal quality assurance activities.

Also the experts appreciated that the university took into account skills mentioned in the curricula recommendations of the professional societies from the area of computer science such as ACM, IEEE, AIS when developing its degree programmes. Furthermore an external programme council consisting of industrial and academic experts is in the process of development which shall strategically advise the creation and further development of the degree programmes of the faculty. The experts took note that the university additionally compared each programme with three study programmes at other European universities from the same area. However they did not understand why UL FRI chose the mentioned degree programmes as a reference point and what results derived from this comparison. Hence the experts asked for clarification in this regard.

Comparing the learning outcomes, the experts did not fully understand the difference between both Bachelor's degree programmes. Thus they asked for clarification. They learned that the diversification of professional and academic degree programmes is in line with the strategy of the university. In fact, UNI and PROF degree programme differ a lot when it comes to general objectives, admission requirements, structure and curricula. The UNI programme is an academically oriented university programme meant to be continued at the Master's level, while the PROF is an applied and engineering oriented programme typically meant to be finished at this stage and di-

rectly leading to the job market. For admission the UNI programme requires a completed Baccalaureate and an exam. The PROF admission requires only a completed final exam at any four-year secondary school. Regarding the structure of the degree programmes the UNI programme is more predetermined while the PROF programme is characterized by free choice for students, enabling them to individually design their course of study and to tailor their studies according to their own needs or the demands of the labour market, respectively.

The experts comprehended the difference between the two Bachelor's programmes. They highly valued the idea of both types of education. However, they noted that the described differences between both programmes are not stipulated clearly in the description of the programmes. The stated learning outcomes seemed to be nearly identical for UNI and PROF. The experts pointed out that ideally the learning outcomes of a single programme should be discussed and defined in a first step as central reference point for the further design of a programme. Also differences in profile and scope of a programme would then have to be reflected at the level of intended learning outcomes in order to support a coherent implementation in the curricula. In a second step curricula and structure of the respective programme should be developed in such a way that it enables the students to achieve the intended learning outcomes. The experts understood that both programmes have existed already for several years and that working with learning outcomes started later. But still and for further development of the programmes they would recommend using precisely defined learning outcomes for alignment of curricula, structure, educational methods etc. The experts welcomed the information of UL FRI that a Curricular Committee already has begun the process of re-elaborating the intended learning outcomes individually for each of the programmes.

Concerning the stated learning outcomes of the Master's degree programme the experts noted that up to now they do not reveal a specific profile of the programme. In the experience of the peers, HEIs often have strategic research goals and based on those, profiles of their Master's programmes are defined. The experts learned that the structure of the MS programme is currently being reworked by the faculty aiming at shaping and profiling programme and graduates. They welcomed that information and pointed out that this process should also be used for specifying the intended learning outcomes of the Master programme.

Eventually the experts compared the stated learning outcomes of all three programmes with the exemplary learning outcomes set out in the ASIIN Subject-specific Criteria (SSC) relating to the accreditation of Bachelor's and Master's degree programmes in informatics. The SSC describe formal, algorithmic and mathematic competences as well as analysis, design and implementation competences the students should acquire in the degree programmes. Furthermore, technical competences as well as methodological competences are described and project management competences are mentioned. The auditors ascertained that the intended learning outcomes of the programmes under review are basically in line with the SSC. However, as the UL FRI learning outcomes are presented in a rather generic way with significantly lower level of detail in respect to the SSC this comparison had to be built on individual interpretation of the peers.

Strengths and weaknesses

The experts regarded it as one of UL FRI strengths that the two Bachelor programmes UNI and PROF with their different profiles are offered. However, regarding all three programmes they would recommend to draft the learning outcomes more programme-specific and distinctive thereby clarifying the acquired competences of the graduates in a more tangible manner. The difference between the programmes and the specific profile of the graduates should be visible from the intended skills-/competence profile expressed via the list of intended learning outcomes.

Evaluation Criterion I.3: Learning outcomes of the modules/module objectives

Evaluation questions:

(How) Are the intended learning outcomes for the programme as a whole systematically put into practice within the individual modules of the programme?

Are the intended learning outcomes and the prerequisites for achieving them clearly understandable to students?

Analysis and findings of the peers

The modules are described in module handbooks which are available for students on the website. The auditors confirmed that the module descriptions are detailed and provide all relevant information required to comprehend which knowledge, skills and competences students are expected to acquire in the individual modules. The objective and competences, intended learning outcomes and prerequisites, the student workload, the contents of the modules and the examination rules for achieving them are expected to be clearly understandable to students. During the discussions the peers learned that the students work with the module descriptions and are satisfied with their structure and information. Only a few of the descriptions seem to be not very concrete.

The experts noted that a module description for the Project Practicum seems not to be available. Furthermore they pointed out that the submitted matrix, intended to make transparent which modules support which programme learning outcomes is not that meaningful as long as the programme learning outcomes are not specified in there. In the course of reworking the learning outcomes also the matrix could be revised because the latter could also serve as an internal tool for checking consistency of the programme, coverage of programme objectives and contribution of modules.

Strengths and weaknesses

No specific strengths and weaknesses are derived from this chapter. Nevertheless, as pointed out already in the previous chapters, learning outcome oriented curriculum development could be used more intensely in day to day practice of the faculty as a practical approach for profiling the programmes under discussion and controlling their internal logic and coherence.

Evaluation Criterion I.4: Needs of stakeholders and practical relevance

Evaluation questions:

To what extent has the applicant institution decided to address identified needs of stakeholders and – if applicable – why it might not have taken into account some of the needs identified?

What links to professional practice are covered within the educational programme?

Analysis and findings of the peers

During the discussion with UL FRI the experts learned that graduates of the degree programmes under review have very positive job market perspectives. In several cases a contract of employment is already offered during the study period, which raises the problem that a significant number of students do not finish their studies because entering the job market at an earlier stage. Employers in Slovenia are usually small and medium-sized enterprises, mostly software development houses. Against this background the experts comprehended that UL FRI has the aim to impart firm and broad competences and a sufficient amount of basic and theoretical knowledge. However, they questioned the share of software engineering in the curricula (cf. I.6: Curriculum/content) as being rather small compared to other skills and competences that are to be achieved.

The faculty receives feedback from employers regarding the students' competences on a regular basis through an evaluation filled in by the company supervisors of the industrial practice within the Prof programme. Furthermore a Programme Council is being established as a standing committee with representatives from industry and academy, which shall strategically advise the creation and development of the degree programmes.

The peers deemed the practical elements included in the programmes to be sufficient in order to prepare students for dealing with industry-related problems and tasks. They understood that the PROF students have to complete an Industrial Practice lasting 9 weeks with a workload of 18 ECTS. Students search a placement on their own but have the possibility to resort to a list of possible companies offered by the faculty. Tasks and intended learning outcomes are agreed previously between the mentor of the faculty and of the company. After completion the students write a report that has to be approved by both the company mentor and UL FRI mentor. The experts learned that the students would welcome such an Industrial Practice also in the UNI programme. But in the discussion with the faculty they got the impression that also in the UNI and MS programme practical elements are sufficient for fostering respective skills of the students. For example projects with mentors from the faculty and from industry are conducted, which are financed by the ministry. In addition, specific issues companies have to deal with are discussed and solved in the course of the studies. Furthermore new topics are selected yearly and integrated in the curricula with the needs of the industry in mind. Eventually the courses Computer Science in Practice in the UNI and PROF programmes and Extracurricular Professional Activities in the MS programme can each award up to 6 ECTS for significant extracurricular activities and achievements,

such as completion of a company challenge, a successful appearance in computer science competitions or teaching in summer schools.

Strengths and weaknesses

No specific strengths and weaknesses are derived from this chapter. Nevertheless the experts appreciated that UL FRI is in close contact with the industry and includes links to professional practice within the educational programmes.

Evaluation Criterion I.5: Admissions and entry requirements

Evaluation questions:

Are the admission requirements for attending the programme clearly defined and publically available?

How far do the admission and entry requirements support/contradict the achievement of the learning outcomes?

How far do these requirements ensure that the students admitted possess the necessary competences and formal training for being able to succeed in the programme?

If students with identified gaps towards the admission requirements are admitted, what offers and support for closing these gaps within a reasonable and predictable timeframe are available?

Analysis and findings of the peers

The auditors discussed the admission rules and procedures for the three programmes under discussion with the faculty representatives. To enrol in the UNI programme, candidates need a completed Baccalaureate or a completed professional Baccalaureate at any secondary school and an exam from one of the following subjects: computer science, mathematics or physics. To enrol in the PROF programme candidates need a completed final exam at any four-year secondary school, a completed professional Baccalaureate, or a completed Baccalaureate. In both programmes candidates will be selected based on their Grade Point Average (GPA) and the results on final exam, Baccalaureate or professional Baccalaureate.

Admission requirement for the MS programme is a completed first cycle study of computer science, natural sciences or engineering. Also graduates of other degree programmes can be admitted when they completed the following courses from the 1st cycle study programme of Computer and Information Science prior to enrolment: Introduction to Programming, Discrete Structures, Introduction to Digital Circuits, Computer Systems Architecture, Introduction to Information Systems, or who covered the subject matter of these courses in their undergraduate studies. The enrolment criteria are based on the GPA achieved during undergraduate studies and results on a selection exam. The exam encompasses basic knowledge of programming, algorithms, computer systems, and mathematics.

According to the peers this selection exam allows the faculty to admit candidates that possess the necessary competences for being able to succeed in the programme. Furthermore they welcomed that the faculty offers introductory knowledge revision courses in mathematics and programming for the students of UNI and PROF. Also student tutors are available 2 to 4 hours a week. But the experts learned also that some students do not participate in these additional courses and fail the exams.

The admission requirements for attending the programmes are clearly defined in the detailed programme descriptions and publically available. Criteria for recognizing knowledge and skills acquired prior to enrolment and for transferring between programmes are described as well. The experts appreciated the clear description of the requirements. They welcomed especially that students can switch from UNI to PROF programme and vice versa and that graduates of the PROF programme are also admitted to the MS programme, even though the PROF programme is typically meant to be finished at the Bachelor's stage and graduates of the PROF programme have disadvantages in comparison to the UNI graduates when it comes to the questions in the selection exam due to their previous knowledge. In the discussion with the students the experts learned, that several graduates of the PROF programme enrolled in the MS programme and that they do not get into difficulties.

Strengths and weaknesses

The experts regarded it as one of UL FRI strengths that admission requirements and transferring criteria are clearly defined and allow students to switch from UNI to PROF programme and vice versa and that graduates of the PROF programme are also admitted to the MS programme.

Evaluation Criterion I.6: Curriculum/content

Evaluation questions:

To which extent is the curriculum/syllabus/content provided adequate to enable the achievement of the defined learning outcomes of the programme?

Would teaching staff, students and stakeholders such as potential employers consider the curriculum to be well-designed with respect to the targeted learning outcomes?

Analysis and findings of the peers

The auditors assessed the curricula of the programmes under review against the programme objectives provided in the self-assessment report and presented in the discussions. The peers appreciated the information given by the faculty that the curriculum is updated regularly by the Curricular Committee and that students and teachers have the possibility to influence the curricula development. They were aware of the ambition of the faculty to modernize the curriculum continuously and valued this highly.

Against the background that most of the graduates work in the fields of software engineering as most of the employers in Slovenia are software development houses the experts questioned the share of software engineering in the curricula of the UNI and the PROF programme as rather low. They learned that recently several new topics were included in the curricula but no course dealing explicitly with software engineering. To foster the qualifications of the students that are necessary for the labour market the experts would recommend to add a compulsory course in software engineering in both Bachelor curricula. A systematic way of producing larger software systems should be taught in the programmes. Furthermore, the peers expressed the idea to include a project in the curriculum of both Bachelor programmes to give students an idea of a software lifecycle and hence to enhance their professional qualification.

In addition, the experts questioned how a sound introduction into theory of informatics is provided in the UNI programme. They would expect a share of formal languages, theory of automata and computability in the programme, also for enabling students to be admitted to a Master's programme at another university. The experts appreciated the information that the faculty integrated computability, language theory and automata in the programme in course of its last revision. The new curriculum comes into force in 2015.

When assessing the UNI programme the experts expressed their astonishment that a course in Physics is integrated in the programme. They understood the explanation of the faculty that students with a background in physics are typically better capable of solving certain problems in informatics. Furthermore the faculty described that the intention to give the students a choice between several courses in the field of natural sciences failed due to problems with overlaps in the scheduling of the natural sciences offers and other relevant modules. The experts questioned whether a course in natural sciences awarding 6 ECTS is generally appropriate to impart the mindset the faculty intends to. They pointed out that in most European programmes similar courses are removed and are by now rather unusual in software oriented programmes.

The experts also questioned how knowledge in the field of distributed systems is imparted in the programmes. They realized that the UNI programme offers one elective course "Distributed Systems", which focuses on the basic concepts of parallel and distributed systems. Also in the PROF programme one elective course "Parallel and Distributed Systems and Algorithms" is provided. However, altogether the peers got the impression that the fields of distributed systems is not one of the strengths of the programmes. The faculty confirmed that at present it is understaffed in that field.

Furthermore the experts realized that the students have a very good command of English. They learned that by law all courses have to be taught in Slovenian but the faculty members invest impressive efforts to provide a lot of them in English in parallel. In practice they offer as many courses in English so that the MS programme can be completely studied in English. The faculty aims at attracting more and more international students and offers therefore not only courses in English but also examinations, literature etc. in this language.

When assessing the MS curriculum the peers questioned the profile and the level of the programme. Contrary to what the names of the four compulsory courses “Mathematics”, “Programming”, “Algorithm” and “Computer Systems” might suggest the content reveals itself to be indeed at the level of a Master’s degree programme according to level 7 of the EQF. Besides these four compulsory courses the programme is composed of 29 specialist elective courses, 3 general elective courses and the Master’s thesis. Up to the present the students are free in choosing the elective courses and there are no guidelines structuring the course of study. The result is that graduates of the programme can have a specific profile but do not need to. The experts recommend that developing a profile for the Master’s programme could be beneficial for the students, especially when it comes to continuing with a PhD programme. During the discussion with the UL FRI the experts learned that the structure of the MS programme is currently being reworked aiming at shaping and profiling programme and graduates. According to the proposal the specialist elective courses are grouped into the following modules: Software, Information and management systems, Networks and security, Algorithms, Hardware, Multimedia, Artificial intelligence, and Computational methods. Students will be obliged to select courses from two modules, and will be able to choose the remaining courses irrespective of their module membership.

Strengths and weaknesses

The experts regarded it as one of UL FRI strengths that the ambition to continuously modernize the curriculum is very high. The experts learned that most of the issues they discussed during the meetings are already dealt with in one way or another within the faculty’s bodies. This reflects also the ability of the faculty to identify problems in the programmes and new developments in the fields of informatics.

However, the experts recommended some further developments concerning the curricula. First they would require adding a compulsory course in software engineering in both Bachelors’ programmes to enhance the professional qualification of the graduates. They would also recommend to replace physics in the UNI curriculum. Furthermore they saw a weakness concerning coverage of distributed systems. Eventually they strongly supported the recent considerations of UL FRI: offering courses in theory of informatics in the UNI programme and profiling the MS programme.

II. Degree Programmes: structures, methods and implementation

Evaluation Criterion II.1: Structure and modularity

Evaluation questions:

Are there modules that coherently and consistently “group” the content following the logic of the intended learning outcomes?

How far does the level of each single module support the achievement of the intended learning outcomes of the programme as a whole at the qualification level aimed at?

Are the selection and sequence of modules relevant to achieving the intended overall learning outcomes?

Analysis and findings of the peers

The experts observed that the structure of the two Bachelor’s programmes differs fundamentally. In the UNI programme the first three semesters start with mandatory courses. From the beginning of the third semester the students can choose from different courses. Elective courses are grouped in the following modules: Information Systems, Management of Information Systems, Software Engineering, Computer Networks, Computer Systems, Algorithms and Systems Utilities, Artificial Intelligence and Multimedia. The courses in one group are complementary in their contents.

The structure of the PROF programme seems to be very complicated at first glance (see p. 11). Year 1 contains ten obligatory courses, while year 2 is comprised entirely of elective courses. Also year 3 consists of several elective courses. The choice of courses is not without restrictions; they are limited by a system of prerequisites that defines relations among the courses. The programme does not have a classical structure of a set of modules, but is based on the prerequisite system for the majority of elective courses, i.e. the system determining the specific courses students must complete to be able to subsequently choose other courses. In this way students are lead through the programme along certain paths, which define their specialisations. The experts noted that this structure does not lead to one defined study outcome profile but to very differentiated and specialized competences. This specialization is also stipulated clearly in the Diploma Supplement given to the graduates. During the discussion with students the experts learned that the structure of the programme does not cause any difficulties for the progress in studying. The peers came to the conclusion that they appreciate the structure of the PROF programme which allows specialization and flexibility.

The MS programme is composed of four compulsory courses and six elective courses in the first year. The second year consists of the Master thesis as well as six elective courses. As already mentioned above, the peers supported the idea of the faculty to shape and profile the programme. Their first impression that the compulsory courses incorporate also modules at undergraduate

level was revised: According to the peers the content is indeed taught at the level of a Master's degree programme.

The peers learned in the discussion with the students that up to now several problems occurred within the modules: The single courses within one module are usually taught by different teachers. The students criticised that the teachers did not coordinate their courses and as a consequence the content of the courses overlapped or was not well matched. With this regard the experts welcomed the information of the students that the student evaluation resulted in a conversation of the teachers in which they discussed the modules and fixed the content of the single courses. The students were confident that they will see the effect of this conversation within the next year.

During the discussion with UL FRI the experts questioned whether the programmes contain a "window of mobility", which means a certain semester in which students can study abroad. They learned that there is no typical semester defined but that students usually go for the second or third year because these are more flexible due to the elective courses. The faculty recognizes modules completed externally flexibly and driven by content not formalisms. The experts appreciated this information.

Strengths and weaknesses

The experts appreciated the structure of the PROF programme very much and looked at it as one of the strengths of UL FRI.

Evaluation Criterion II.2: Workload and credit points

Evaluation questions:

Are the estimated time budgets realistic? Which evidence do you have?

Is the information about how and where the time budget to be spent by a student made transparent to the student themselves as well as outside stakeholders such as employers?

How far does the student workload foreseen avoid structural pressure on teaching and learning quality and support the adequate qualification level?

Are projected time budgets realistic, so that the programme can be studied within the standard period of study for the degree?

With regard to the eventual award of credits for practical components: Are practical components meaningfully integrated into the curriculum design? Are such periods supervised by teaching staff from the higher education institution?

Analysis and findings of the peers

The experts acknowledged that the information about how and where the time budget to be spent by a student is made transparent in the module descriptions. 1 ECTS credit equates to 25-30

hours student workload. The faculty has several mechanisms to control the adequacy of the workload, such as student surveys and special workload surveys. During the discussion with the students the experts learned that the awarded credit points do not always represent the actual workload. However, the workload in the first and second year of the Bachelor programmes is in general evenly distributed throughout the year. A survey conducted by the student council revealed that the workload in the third year of the UNI programme is increased but depends also on the chosen electives. The modules “Artificial Intelligence”, “Multimedia” and “Software Engineering” stand for a high workload whereas students do not need the intended time for other modules as for example “Management of Information Systems”. In principle the students expressed their confidence that student surveys as well as the new student information systems records the actual workload and that UL FRI adjusts the workload or credit points where needed. But they criticised that the results of these evaluations are not regularly communicated to the students and the feedback loop is therefore not closed. The experts learned that due to data protection up to now only dean and student council are provided with the results. The evaluations take place very late in the semester in order to avoid any influence on the examinations. This is another reason why the results are not communicated to the students regularly. Overall the experts saw room for improvement in this regard. They recommended closing the feedback loop in order to provide students with a feedback and keep them motivated to participate in the further development of the programmes.

When assessing the module descriptions the experts noted that the ratio between lectures and practical work is mostly identical and not, how they would have expected, different depending on the content (for example the ratio for Mathematics 2 and Programming in the MS programme is the same). They learned that UL FRI chose the identical ratio for practical reasons and that teachers are able to organize their lessons in a way that they meet the requirements. However, in the discussion with the teachers the experts were told that the constant ratio irrespective of the topic is regarded as rather obstructive. Hence the experts saw need for discussion within the faculty concerning the ratio.

The auditors discussed with the faculty whether it is possible to study the programmes within the standard period of study. They learned that the number of students who graduate in the minimal amount of time is on average around 30 percent. A very high number of students (18 percent of first year students in the UNI programme and 45 percent of the students in the PROF programme) are inactive and do not pass a single exam. This is an effect of state regulations that guarantee students several benefits and a university study free of charge. A recent amendment in the legislation will change the situation in the future: Students will be allowed to repeat the first cycle and the second cycle once; otherwise they will lose their status as a student. However, the experts appreciated that the students seem to be able to finish their studies within the standard period of time. But they questioned whether the university thinks about offering the programmes also in a part-time or dual version in future in order to attract those students who are inactive up to now. In the discussion with staff as well as students they comprehended that offering a part-time version will probably not solve the problem as most of the inactive students are mainly interested in

having the student's status and not in the study programme. Nevertheless a part time solution could be attractive for those entering the profession before termination of studies and thus being in danger not to get their degrees.

Strengths and weaknesses

The experts appreciated that UL FRI uses several methods to record the actual student's workload. However, they recommended a further development regarding the student evaluations. In order to motivate students to participate in the further development of the programmes and to fill in questionnaires referring to this they recommended to regularly give students a feedback and close the feedback loop.

Evaluation Criterion II.3: Educational methods

Evaluation questions:

To what extent do the specific methods and didactic approach support or contradict the achievement of the intended learning outcomes?

What specific needs of single student groups are met through the specific choice of methods and didactic solutions?

What range of elective and compulsory elective subjects to allow students to develop an individual focus is offered?

How far do students get the opportunity to carry out independent academic work?

Analysis and findings of the peers

As already mentioned above, the curricula of all three programmes are composed by compulsory and elective courses. The experts appreciated that foundational compulsory courses are offered at the beginning of all programmes but are followed by a strong elective component. They deemed the range of elective courses as very good and appropriate to allow students to develop an individual focus.

During the discussion the students mentioned that a tutoring system is offered in the first year of the Bachelor's programmes especially for Mathematics and Programming. But they would highly appreciate to have tutoring courses also in the following years. Due to a regulation that tutors are paid by ECTS credits there is up to now no incentive to provide a tutoring system also for the second year of the Bachelor's programmes. Hence the experts would recommend to establish a system that stimulates the offering of tutorials also in the second year.

Against the background of the shift from teaching to learning in university's teaching principles the auditors questioned what kind of educational methods are used by the teachers. They learned that UL FRI aims to use innovative methods. It supports teaching by the eClassroom virtual learning environment and uses E-learning technology for courses offered by foreign visiting lecturers. The peers appreciated this effort. However, during the discussion also with the students they

gained the impression that many teaching formats include big group sizes and a lecture-style mediation of knowledge. There are indeed practical components and labs as smaller teaching formats including interaction between teachers and students. In exercise groups tasks are performed in teamwork and within several weeks. Students in the MS programme work on research projects and present them in front of the class, which gives students the opportunity to carry out independent academic work. However, the experts would recommend to broaden activating teaching formats and to introduce educational methods such as seminars in order to involve students more actively in the process of teaching and learning.

Strengths and weaknesses

The experts regarded the structure of the degree programmes as one of UL FRI strengths. They valued highly the share in compulsory and elective courses in all three programmes. They deemed the range of elective courses as very convincing and appropriate to allow students to develop an individual focus. However, the experts recommended some further developments concerning the teaching formats and didactic approach. They suggested to establish a system that stimulates the offering of tutorials not only in the first year of the Bachelor's programmes. Furthermore they recommended offering more activating teaching formats in order to involve students more intensely in the process of teaching and learning.

Evaluation Criterion II.4: Support and assistance of students

Evaluation questions:

To what extent do the support and assistance offers to students influence their achievement of the intended learning outcomes?

To what diverse needs of students the specific support and assistance are the offers addressed to?

Are the students satisfied with the support and assistance offered for achieving the education objectives?

Analysis and findings of the peers

The auditors appreciated the system of assistance for students within UL FRI. Students are supported for example by teaching staff contact hours, tutoring system, Career Centre and Student Council. In particular the Student Council made a very good impression on the experts. It serves as first resort for students' questions and needs and is as a contact point also able to identify problems occurring in the degree programmes. Overall the experts deemed the system of quality management to be very positive. It leads to a quick identification and solution of problems and ensures a closed PDCA-cycle.

The students expressed a high level of satisfaction during their discussion with the peers. They mentioned in this regard in particular the dean and the student council. Advice was also offered

for designing the individual study plan and choosing the electives. The auditors could see that sufficient resources are available for offering individual support, supervision and advice to students.

Strengths and weaknesses

The support system for students is according to the peers one of the strengths of UL FRI. They noticed a very high student's satisfaction and appreciated the prevailing system of quality management very much.

III. Examinations: concept and organisation

Evaluation questions:

How far does an individual and comparable assessment for all students take place to determine whether the learning outcomes have been achieved?

Do the examination methods chosen create evidence on this achievement of learning outcomes and thus are learning outcome-oriented?

Does the degree programme end with a final thesis or equivalent that guarantees that students can carry out an assigned task independently and at the level of the qualification sought?

Is it checked whether students are capable of orally discussing a problem from their specialist area and how it might be solved, placing it in the context of the subject?

By what means is the final thesis – if carried out externally e.g. in co-operation with industry - meaningfully incorporated in the curriculum?

Are form of examinations and criteria used for the individual assessment of student performance documented so that all students can be aware of them?

Are examinations subject to a strictly defined process and rules?

Are examinations coordinated in a way to grant the students enough preparation time?

Analysis and findings of the peers

The examination system is regulated in the UL FRI Study Rules and Regulations. Furthermore the university provided regulations concerning the graduate thesis for the first cycle programmes and the Master thesis. The course descriptions define the type of examination and obligation of the students. Hence the experts came to the conclusion that examinations are subject to a strictly defined process and rules and forms of examinations are documented so that all students can be aware of them.

Three exam dates are issued for every course in one academic year. For every course in the fall term two exam dates are issued in the winter examination period and one date in the fall examination period. For every course in the spring semester two exam dates are issued in the spring period and one exam date in the fall period. The schedule for exam dates must be composed so

that students have the possibility of attending at most one exam per day in the study year they are enrolled in and that there is a gap of 14 days between two consecutive exam dates for each course. As a consequence the first examination phase is very tight and teachers have to assess the written examinations within one week, which is, according to the peers, very ambitious. The experts expressed also their astonishment that exams can be taken up to five times. They learned that this is a matter of a legal requirement stated in the Law on Higher Education. A recent amendment will change the situation to that effect that exams can be taken at most four times, which is still very often according to the peers.

Course exams are written and/or oral. UL FRI puts students also into a free speaking and presenter role during their study in order to train students in orally discussing a problem from their specialist area. During the discussion with teachers and students the experts gained the impression that UL FRI bears in mind the constructive alignment between learning outcomes and assessment when defining the form of examinations.

All degree programmes are completed with a final thesis. The thesis mentor must be a member of the teaching staff with the habilitation to the title of Assistant Professor, Associate Professor or Full Professor. Candidates defend their thesis before the committee consisting of the mentor and at least two members of the Faculty teaching staff. The preparation of the Master's thesis is distributed through the entire second academic year (12 ECTS credits in the third and 12 ECTS credit in the fourth semester). A compulsory component of the preparation of the Master's thesis is the attendance of the Master's Seminar, in which they must report on the progress and results of their work at least once. The experts comprehended this procedure and appreciated it.

Strengths and weaknesses

No specific strengths and weaknesses are derived from this chapter.

IV. Resources

Evaluation Criterion IV.1: Teaching staff involved

Evaluation questions:

To what extent does the composition of the teaching staff in quantity and quality support/contradict the achievement of the intended learning outcomes by the students?

How satisfied are the students with the teaching skills and competences of the teaching staff?

What research and development activities of teaching staff would support the realisation of the academic level sought for the programme?

Are the available contact hours sufficient for teaching and student's assistance?

Analysis and findings of the peers

The auditors considered the composition and qualification of the staff involved in teaching to be adequate in order to facilitate the achievement of the objectives of the degree programmes. UL FRI employs full professors, associate professors, assistant professors, assistants with a PhD, assistants with a MSc. and assistants PhD students. Every five years a teacher can apply for a sabbatical lasting at most twelve months. Also participating in international conferences is supported by the faculty. The number of visiting lectures is rather small and they do not teach the compulsory courses but special courses, for example in the field of management skills or economics.

UL FRI offers training courses for the development of didactical competences. The experts noticed during the discussion with the teachers that several assistants already participated in such courses. According to the experts the recently developed mechanism “Critical friend” was particularly interesting, which is currently in the testing phase. Each course lecturer will receive annual feedback from two teachers who will attend the lectures and analyse course, workload and examination.

The auditors assessed the staff resources available as sufficient in quantity and quality for the successful implementation of the programmes. They appreciated in particular the well educated and enthusiastic staff. Only the field of distributed systems seemed to be understaffed at present (see I.6 Curriculum/content).

Strengths and weaknesses

According to the experts the enthusiastic staff is one of the strengths of UL FRI. The high motivation of the staff ensures also the good quality and constant development of all three degree programmes under review.

Evaluation Criterion IV.2: Institutional environment, financial and physical resources

Evaluation questions:

Is the funding for programme secure at least for the period to be certified?

How far is the infrastructure effectively at disposal in line with the programme requirements as to quality and quantity?

Where applicable: Are any internal and external co-operations required for the programme suitable and have they been defined in a binding way?

Are the organisational and decision-making structures suitable for putting the programme into practice?

To what extent is the organisation capable of reacting to problems, solving them and compensating shortfalls without any negative effect whatsoever on the possibility of completing the programme?

Analysis and findings of the peers

In the discussion with the university the auditors questioned the financial basis of the programmes. They understood that the university receives a fix amount from the state which was supplemented by an amount that was awarded based on quality criteria. Due to the persistent economic crisis for the country, the additional money is not paid at present. However, the auditors gained the impression that the financing of the programmes is assured in principle, at least for the accreditation period. Also third-party funds are available and in particular raised by full professors for conducting research and development projects.

The auditors had the possibility to visit the relevant laboratories. As UL FRI moved in July 2014 to new premises the building, equipment and resourced were very convincing. Although still some problems exist due to the relocation (for example working hours of the library) the experts came to the conclusion that the infrastructure is in line with the programmes requirements.

The university holds cooperation agreements with universities abroad. The auditors appreciated in particular the double degree programme with Technical University Graz. The double degree study started in 2013/2014 with one student from UL FRI. 2014/15 two students are going to spend one semester in Graz. UL FRI explained during the discussion that it aims to establish this kind of degree programmes also with other universities. But it also offers already exchange programmes (amongst others 30 bilateral exchange Erasmus + agreements with computer science departments at other universities) within the normal degree programme. In the discussion with the students they mentioned that they would appreciate exchange programmes also with the United States. Furthermore the experts noticed that amongst the students the motivation to spend some time abroad seems to be not very high. The experts gave the advice to make use of the existing cooperation and to spend part of their studies abroad.

The peers deemed the organisational and decision-making structures suitable for putting the programmes into practice. The autonomy of the faculty is very high, in particular regarding the establishment and further development of degree programmes. But in the discussion with the teachers the experts learned that despite the small unit the hierarchy is rather distinctive. The 20 laboratories are grouped under six chairs which are themselves subordinated to the dean. The teachers criticised that in some cases the laboratories do not fit to the superior chair and the communication between laboratories and laboratories and chairs is not satisfactory. Furthermore the assignment of the big compulsory courses to the teachers is seen as an area for improvement. The experts took note of these structural issues and saw need for discussion within the faculty.

Strengths and weaknesses

The experts appreciated the resources, the new building and the equipment as to be appropriate for successfully teach and learn in the programmes under discussion. UL FRI offers now excellent spatial and working conditions. The experts saw another strength of the programmes in the international orientation. Exchange programmes, the dual degree programme with Graz, the stipulated rules of recognition and the ambition to compare the degree programmes with similar European degree programmes is considered very positive.

V. Documentation and transparency

Evaluation Criterion V.1: Relevant regulations

Evaluation questions:

Do the statutes, agreements, regulations etc. on which the programme is based contain all provisions relevant for admission, actual study/training and conclusion of it?

Are the regulations accessible for all students?

Analysis and findings of the peers

The regulations for study-relevant issues are in place and made available. These regulations include all the information necessary about the admission, course and completion of the degree.

Strengths and weaknesses

No specific strengths and weaknesses are derived from this chapter.

Evaluation Criterion V.2: Diploma Supplement and qualification certificate

Evaluation questions:

Does the leaving certificate (incl. diploma supplement) appropriately grant all interested parties insight into the learning outcomes, structure, contents and level of the concluded programme and the student's individual performance?

Analysis and findings of the peers

UL FRI submitted three Diploma Supplements – one for each programme. These documents describe the awarded qualification and grant all interested parties insight into the concluded programme and the student's individual performance. In detail, the Diploma Supplements provide information about the learning objectives (although the experts noticed that only the general competences and not the specific skills are described), structure, content and level of the studies specifically for each programme, the success of the graduate as well as about the composition of the final grade. The experts recommended to provide in addition to the national grade a grading table in line with the ECTS Users' Guide in order to assist in interpreting the individual degree.

Strengths and weaknesses

The experts recommended a further development regarding the Diploma Supplement. According to the ECTS User's guide statistical data should be provided to assist in interpreting the individual degree.

D Appendix

Documents provided by UL FRI

Self-assessment report for the purpose of ASIIN programme evaluation, 20th of October 2014

Appendices:

A01 UNI detailed description of the programme, 2014

A02 PROF detailed description of the programme, 2014

A03 MS detailed description of the programme, 2014

A04 UNI Module Handbook, 2014

A05 PROF Module handbook, 2014

A06 MS Module Handbook, 2014

A07 UL FRI Study Rules and Regulations, 2012

A08 UL FRI Annual Report for 2013

A09 Regulations for the Graduate Thesis of the UL FRI First Cycle Study Programmes, 2013

A10 Regulations for the Master Thesis of the UL FRI Study Programmes, 2013

A11 Instructions for the Preparation of the Graduate Thesis at UL FRI, 2013

A12 Instructions for the Preparation of the Master Thesis at UL FRI, 2013

A13 Instructions for the Grading of the Graduate Theses at UL FRI

A14 UNI Diploma Supplement

A15 PROF Diploma Supplement

A16 MS Diploma Supplement

A17 Personnel Handbook, 2014

A18 Teaching and research workload of UL FRI teaching staff, 2014

E Accreditation procedure based on the evaluation procedures

The university of Ljubljana asked for the implementation of an accreditation procedure, complementing the programme evaluation procedure at the faculty. It applied for the ASIIN-Seal as well as the Euro-Inf® -Label for the following degree programmes:

- University Study Programme Computer and Information Science,
- Professional Study Programme Computer and Information Science,
- Master study programme Computer and Information Science.

The accreditation procedure makes use of the evaluation reports delivered as a result of the institutional and programme evaluation implemented at the Faculty of Computer and Information Science.

I. Comments of the Technical Committee 04 – Informatics/Computer Science (11.03.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee took into consideration the evaluation reports, both of the institutional and programme evaluation implemented at the Faculty of Computer and Information Science.

The Technical Committee agreed with all requirements and recommendations.

Assessment and analysis for the award of the Euro-Inf® Label:

The Technical Committee deemed that the intended learning outcomes of the degree programmes comply with the Subject-Specific Criteria of the Technical Committee 04 - Informatics.

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
UNI programme Computer and Information Science	With requirements	Euro-Inf®	30.09.2020

Degree Programme	ASIIN-seal	Subject-specific labels	Maximum duration of accreditation
PROF programme Computer and Information Science	With requirements	Euro-Inf®	30.09.2020
MS programme Computer and Information Science	With requirements	Euro-Inf®	30.09.2020

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) The qualifications profiles (“learning outcomes“ at programme level) have to be more programme-specific and distinctive thereby clarifying the acquired competences of graduates.
- A 2. (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.

For the Bachelor’s programmes

- A 3. (ASIIN 2.6) To enhance the professional qualification of the graduates the compulsory curriculum must cover the area of software engineering.

Recommendations

For all degree programmes

- E 1. (ASIIN 6.1, 6.2) It is recommended further developing the quality assurance concept. In this context, the course based quality survey should be agreed on between students and faculty. Feedback loops with students should be improved. An alumni-survey which is supported by the FRI Alumni Club should be conducted.
- E 2. (ASIIN 2.3) In order to involve students more intensely in the process of teaching and learning it is recommended to offer more activating teaching formats. Furthermore a system should be established that stimulates the offering of tutorials.
- E 3. (ASIIN 2.6) It is recommended to enhance students’ competences in the field of distributed systems.

For the UNI programme

E 4. (ASIIN 2.6) To ensure that all graduates achieve the intended fundamental competences it is recommended to expand the curriculum by further fields of theoretical informatics.

II. Decision of the Accreditation Commission (27.03.2015)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission for Degree Programmes discussed the procedure. It agreed with all requirements and recommendations but made an editorial amendment to the wording of recommendation 1.

Assessment and analysis for the award of the Euro-Inf® Label:

The Accreditation Commission for Degree Programmes deemed that the intended learning outcomes of the degree programmes comply with the Subject-Specific Criteria of the Technical Committee 04 - Informatics.

The Accreditation Commission for Degree Programmes decides about the award of the ASIIN Seal and the Euro-Inf Label as follows:

Degree Programme	ASIIN-seal	Subject-specific labels	Maximum duration of accreditation
UNI programme Computer and Information Science	With requirements for one year	Euro-Inf®	30.09.2020
PROF programme Computer and Information Science	With requirements for one year	Euro-Inf®	30.09.2020
MS programme Computer and Information Science	With requirements for one year	Euro-Inf®	30.09.2020

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) The qualifications profiles (“learning outcomes“ at programme level) have to be more programme-specific and distinctive thereby clarifying the acquired competences of graduates.
- A 2. (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.

For the Bachelor’s programmes

- A 3. (ASIIN 2.6) To enhance the professional qualification of the graduates the compulsory curriculum must cover the area of software engineering.

Recommendations**For all degree programmes**

- E 1. (ASIIN 6.1, 6.2) It is recommended further developing the quality assurance concept. In this context, the faculty should establish a consensus with students about the course based quality survey. Feedback loops with students should be improved. An alumni-survey which is supported by the FRI Alumni Club should be conducted.
- E 2. (ASIIN 2.3) In order to involve students more intensely in the process of teaching and learning it is recommended to offer more activating teaching formats. Furthermore a system should be established that stimulates the offering of tutorials.
- E 3. (ASIIN 2.6) It is recommended to enhance students’ competences in the field of distributed systems.

For the UNI programme

- E 4. (ASIIN 2.6) To ensure that all graduates achieve the intended fundamental competences it is recommended to expand the curriculum by further fields of theoretical informatics.

D Fulfilment of Requirements (08.04.2016)

Analysis of the peers (01.03.2016) and the Technical Committee 04 – Informatics/Computer Science (15.03.2016)

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) The qualifications profiles (“learning outcomes“ at programme level) have to be more programme-specific and distinctive thereby clarifying the acquired competences of graduates.

Evaluation	
Peers	Fulfilled/ partly fulfilled <u>Statement:</u> The descriptions of the qualification profiles are more programme-specific and distinctive thereby clarifying the acquired competences of graduates. However, the description is not ideal as “Knowledge of...” was used very often.
Technical Committee – Informatics/ Computer Science	Fulfilled <u>Statement:</u> Even if the description (e.g. Knowledge of...) is not ideal the qualification profiles are more programme-specific and distinctive.

- A 2. (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.

Erstbehandlung	
Peers	Fulfilled/ partly fulfilled <u>Statement:</u> The diploma supplement now includes statistical data if the number of graduates is above 19 in two years before the date of graduation. If there are 19 or fewer graduates this information won't be included. The peers' state that the university presented a clear and comprehensible solution, however it is unclear if the requirement is fulfilled as the ECTS User Guide leaves room for interpretation regarding the presented size of the cohort.
Technical Committee – Informatics/ Computer Science	partly fulfilled <u>Statement:</u>

<p>informatics/ Computer Science</p>	<p>The technical committee follows the peers' assessment that requirement A2 is only partly fulfilled as the university now includes statistical data in the diploma supplement, provided that the number of graduates in the two years before the date of graduation exceeds 19. Recently, the number of graduates stayed below 20, so the Technical Committee fears that this regulation might cause problems for students when applying at other universities. They may face disadvantages in the admission process by not being able to provide statistical data in addition to the final marks.</p>
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For the Bachelor's programmes

A 3. (ASIIN 2.6) To enhance the professional qualification of the graduates the compulsory curriculum must cover the area of software engineering.

Erstbehandlung	
Peers	<p>Fulfilled <u>Statement:</u> In both Bachelor programmes a mandatory module "Software engineering" is now included.</p>
Technical Committee – Informatics/ Computer Science	Fulfilled

Decision of the Accreditation Committee (08.04.2016)

Assessment and analysis

The accreditation commission discusses whether requirement 2 is fulfilled as statistical data are now included in the diploma supplement if the number of graduates is above 19 in two years before the date of graduation. It states that the university presented a clear and comprehensible solution, however the university is encouraged to make full use of the grade distribution tables as proposed by the ECTS Users' Guide even if the number of graduates is below 20 in two years before the date of graduation.

The accreditation commission follows the assessment of peer panel and technical committees and assesses all requirements to be fulfilled.

The accreditation commission decides the prolongation of the accreditation as follows:

Degree Programme	ASIIN-seal	Subject-specific labels	Maximum duration of accreditation
UNI programme Computer and Information Science	All requirements fulfilled	Euro-Inf®	30.09.2020
PROF programme Computer and Information Science	All requirements fulfilled	Euro-Inf®	30.09.2020
MS programme Computer and Information Science	All requirements fulfilled	Euro-Inf®	30.09.2020