ASIIN Accreditation Report

Bachelor's and Master's Degree Programmes
Mechanical Engineering

offered by
University of Belgrade

Last update: 11.04.2013

Basic information about the accreditation procedure

Degree programmes	**Bachelor's and Master's Degree Programmes Mechanical Engineering**
Higher Education Institution	**University of Belgrade**
Seals applied for	The Higher Education Institution has applied for the following seals and labels: • ASIIN Seal for the degree programmes • EUR-ACE® Label
Peer panel	Dr.-Ing. W. Hans Engelskirchen, formerly Kolbenschmidt Pierburg AG; Prof. Dr.-Ing. Stephan Kabelac, Leibniz University Hannover; Prof. Dr.-Ing. Jörg Wauer, Karlsruhe Institute of Technology; Prof. Dr. Georg Weidner, University of Applied Sciences Schmalkalden
ASIIN Procedure Manager	Marie-Isabel Zirpel
On-site visit	The on-site visit took place on 26 and 27 February 2013.

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A Preliminary Remark

The on-site visit for the above mentioned degree programmes took place on 26 and 27 February 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 Wauer was asked to act as the 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, and students.

Additionally, the auditors inspected the infrastructure and the technical equipment at the University of Belgrade - Faculty of Mechanical Engineering, Serbia.

The following chapters relate to the Self Assessment Report (hereinafter SAR) provided by the Faculty in January 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 01 - Mechanical Engineering/Process Engineering, valid at the time of conclusion of the contract. In case of the award of other seals or labels, the criteria of the respective seal or label-owner (ENAEE) are considered additionally.

The owner of the label ENAEE has authorized ASIIN to award the EUR-ACE® Label based on the „EUR-ACE Framework Standards for the Accreditation of Engineering Programmes". The assessment for the award of the EUR-ACE® Label is based on the General Criteria of ASIIN as well as on the Subject-Specific Criteria (SSC) of the Technical Committee 01 - Mechanical Engineering/Process Engineering.

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 Higher Education Institution (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 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) Study mode	c) Programme Duration & Credit points	d) First & annual enrollment	e) Expected intake	f) Fees
Mechanical Engineering B.Sc.	Full time	6 semester 180 ECTS	WS 2005 WS	540 per year	Governmentally financed students: no fees; Not governmentally financed Serbian students: 550 € per year; International students: 1500 € per year
Mechanical Engineering M.Sc.	Full time	4 semester 120 ECTS	WS 2008 WS	416 per year	Governmentally financed students: no fees; Not governmentally financed Serbian students: 550 € per year; International students:1500 € per year

Analysis of the peers:

The auditors considered the names of the degree programmes as adequate to reflect the objectives and contents of the programmes. Standard period of study and allocated credit points are within regular range. A part-time study is not provided. The auditors learned that the maximum of expected intakes per study year is specified by the national accreditation: The accreditation gives a limit of students who can enroll in the study programmes. The auditors took note of the other formal aspects of the degree programmes and took it into consideration for their assessment.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 1 Formal specifications

The peers judged the requirements of the said criterion to be adequately met.

B-2 Degree Programme: content concept & implementation

B-2-1 Objectives of the degree programme

B-2-2 Learning outcomes of the programme

The university states in the brochure on "Mechanical Engineering @ University of Belgrade" the following **objectives of the degree programmes**:

"Our aim is to provide our students with all the mathematical, analytical and computing skills that underpin modern engineering practice, while encouraging the creative skills and problem-solving strategies that are so important to a good mechanical engineer. You will learn the skills needed for team leadership and how to apply new technologies in novel situations: the skills you will need to master technical and managerial demands throughout your professional career."

Intended learning outcomes for the study programmes have been defined and outlined for each specialization:

Biomedical Engineering: "The educational program at the department of Biomedical Engineering provides students with the analytical tools to understand how biological systems operate and apply engineering principles to resolve medical and biological problems. Through M.Sc. mandatory and optional courses, students achieve knowledge in different fields such as tissue mechanics, signal processing, biomedical devices, nanotechnology, and get practical experience in organization and functioning of the environment in which they will apply their knowledge in the future professional career. Combining theoretical and practical work student learns to use and maintain modern equipment and performs applied research in biomedical engineering. There is an intensive collaboration between teaching staff of the department of Biomedical Engineering and doctors, biologist, chemists and engineers working in medical facilities and firms, that allow our students to conduct studies, improve existing and develop novel devices, materials and diagnostic methods through their Master thesis. Our approaches in biomedical engineering include invention of new methods, device improvement, equipment maintaining and applying information technologies in clinics."

Aerospace Engineering: "The goals of the Aerospace Engineering programme are to:

• develop in students fundamental understanding of mechanical engineering principles and practices based on mathematical, empirical, numerical and experimental methods,
• provide a comprehensive aeronautical engineering education that develops in students the fundamental skills necessary for the design, synthesis, analysis and research development of aircraft, spacecraft and other high technology flight systems,
• offer opportunities to graduates to perform and interpret experiments and solve real technical problems,
• encourage and develop oral and written communication skills of graduates, and finally
• prepare students for the aeronautical engineering profession and related fields by developing in them attributes needed to make significant contribution to the society and to the engineering profession both now and in the future.
The educational objectives of the Aerospace Engineering programme are to produce graduates whose expected acquired skills, competencies and knowledge should be sufficient to ensure their successful careers in industry, private practice or government, or to enable them to pursue advanced postgraduate studies. Graduates of this department will be skilled practitioners who apply their knowledge and technical skills to solve relevant engineering problems in both aeronautical and any other related profession."

Naval Architecture: The students graduating from the study programme shall have knowledge in: Hydrostatic, hydrodynamics, applied fluid mechanics, strength of materials, numerical methods of structural analysis, ship propulsion and resistance, ship production, maritime rules and regulations, marine engineering, and IT-Technologies.
They shall have skills in: Ship hydrostatic calculations, ship hydrodynamic calculation, ship propulsion analyses, use of classification society's rules, ship strength analysis, ship systems and equipment calculation, computer skills, and ship production.
They shall have competences in: Ship design, ship production, ship survey and ship repair.

Welding and Welded Structures: The students graduating from the study programme shall have the following learning outcomes: Ability to apply mathematics, science and engineering; ability to design welded structures and conduct experiments, as well as to analyze and interpret data; ability to design welded structures, components or a welding process to meet desired needs; ability to function on multidisciplinary teams; ability to identify, formulate and solve engineering problems; understanding of professional and ethical responsibility; ability to communicate effectively; broad education necessary to understand the impact of engineering solutions in a global and societal context; recognition of the need for, and an ability to engage in life-long learning; knowledge of contemporary issues in design, evaluation, reliability and structural integrity analyses of welded structures; ability to use the techniques, skills and modern engineering tools necessary for engineering practice; ability to apply principles of engineering, basic science, and

mathematics (including multivariational calculus and differential equations); ability to model, analyze, design, fabricate and maintain welding structures, components and processes; ability to prepare students to work professionally in the mechanical systems area.

Design in Mechanical Engineering: "Each graduate of the Design in mechanical engineering program will be able to: demonstrate a knowledge of the engineering design methodology and product development in engineering; identify, analyze, and solve technical problems in the areas of machine design such as ergonomic aspects, ecological aspect, aesthetics; demonstrate a knowledge in transformation of biological systems, decision making, calculation and special methods in design application; knowledge in application of experimental results, in using the principles of calculus, and appropriate computer technology; apply creativity in the design of systems, components, or processes; function effectively as a member of a team; communicate effectively through speaking, writing, and graphics, including the appropriate use of computer technology."

Information technologies: "Purpose of the module is to enable students to participate in development of new products which are consisted of mechanical elements, sensors, actuators and software. Students are also trained to participate in simulation software development and in development of the software applications which support enterprise business."

Railway Mechanical Engineering: "Overall intended learning outcomes for students, expected after completion of the Railway Mechanical Engineering Programme, could be defined as the abilities to explain the basic concepts of functioning of different type of the railway vehicles, to apply certain standards and regulations in the field of mechanical engineering in order to solve different engineering problems and the ability to use computers techniques, skills and modern engineering tools necessary for design, testing and maintenance of the rail vehicles. During skill praxis, students gain practical experience on the organization and functioning of the environment in which they will apply their knowledge during the future professional career. Also, they identify models of communication with colleagues and business information flows. The students recognize the basic processes in the engineering practice, in the context of their future professional competence. Also, they establish the personal contacts and acquaintances, that will be able to use during studying or during entering into future employment."

Internal Combustion Engines: The students graduating from the study programme shall have knowledge for a systematic understanding of the IC Engine processes, thermodynamics and heat transfer, fluid mechanics, fuel mixture formation, combustion products formation and combustion chemical kinetics; systematic understanding of reciprocating piston machines components and systems operation and work-flow in system design

(forces, loads, strength, tribology); a critical awareness of current problems and new insights in the field of IC Engines – energy efficiency, environmental impact, social impact, maintenance, cost-effectiveness...; systematic understanding of measurement in mechanical systems, particularly measurement techniques in IC Engine; systematic understanding of IC Engine wear, maintenance, reliability and diagnostics.

They shall have skills in design of mechatronic systems (choice of sensors, actuators and embedded systems); design of measurement chains for steady and dynamic measurements in reciprocating piston machines, organize and perform testing procedures, evaluate and critically analyze measurement results; construct a mathematical simulation model and analyze the energy and exergy efficiency of reciprocating piston machines processes (IC engines and piston compressors); construct and analyze a mathematical simulation model of IC Engine charging and mixture formation system; design and model of reciprocating piston machines elements and systems, and perform multi-criterion analysis and evaluation of system design and performance; analyze and optimize the internal logistics of IC Engine maintenance systems, organize and perform maintenance and diagnostic procedures and to prepare, write and present technical reports.

They shall have competences in study and reflect on technical standards, reports and scientific articles in order to maintain up-to-date knowledge level; able to initiate activity, manage project of product development assignments and take significant responsibility for the work of individuals and teams; able to act in a wide and unpredictable variety of professional levels and they shall be able to learn continually.

<u>Agricultural Engineering</u>:

• “Provide our graduates with a well-rounded education based on an understanding of mechanical and agricultural engineering principles and practices and their bases in science and mechanics, together with an understanding of the global and societal impacts of food technology.
• Offer a curriculum in which the emphasis is placed on how engineering principles are applied in practice rather than on the mathematical methods used in the derivation of new technologies.
• Make sure that the program goes beyond the teaching of current procedures, so that the graduates are enabled to adapt to the changing needs of industry and agricultural praxis.
• Encourage and facilitate the development of graphic, written and oral communication skills of all graduates.
• Impart the essential professional, ethical, and moral values required in engineering practice and food produce.”

Motor Vehicles: “The demand for skilled, educated, and honest professionals continues to intensify as the complexity of the modern automobiles increases. Students will be provided with the tools and techniques necessary to achieve their potential. They will be shown how to produce an idea for product development or how to make decisions related to possible ways for product improvement. Students will learn to use sophisticated methods to design and develop new or improved vehicles and/or components. To achieve this, students will be encouraged to develop the skills and attitudes needed to work effectively in a multidisciplinary design team. As an automotive industry deals with the complex products, processes and constraints, engineers approach to motor vehicles’ development cannot be based on the simple strategy of specifying ‘good quality components’. Designing and assembling of motor vehicles with confidence involves quantifying the function and performance of systems and sub-systems. Working in the modern automotive industry cannot afford to ignore system approach in the process of vehicle’s and/or its components’ development. Accordingly, the motor vehicle’s courses are designed to provide students with the knowledge and skills that links the bottom level component design to the top-level objectives, such as customer satisfaction and cost effectiveness.”

Industrial Engineering: “The department curriculum is programmed to provide students with the skills required by modern industrial engineers, including analysis of product design to determine the optimum manufacturing process, selection of equipment and design of layout, design and installation of systems for controlling production, inventory, quality or cost, job design and methods improvement, design of material handling systems, manpower utilization and work measurement and operations research. In addition to disciplinary content, the Department also encourages students to attain expertise in the use of modern information technologies and take part in professional and extracurricular activities. As a result, our students are able to stand out in many international contests and activities. Altogether, the goal of this department is to produce efficient industrial engineers with a high rate of technical ability, including practical as well as theoretical knowledge, in order to attain secure and responsible positions in competitive arena of industrial and service enterprise.”

Food Industry Engineering: “Graduates will understand the source and variability of raw food materials and their impact on food processing operations. Our students will understand the concepts of material and energy balances in food processing systems, unit operations in food processing, the physics of fluid flow, and mechanisms of heat transfer. Graduates will be knowledgeable of traditional and new types of packaging materials, closures, and delivery systems.”

Production Engineering: “The students graduating from the study programme shall have the following learning outcomes: Knowledge of the engineering principles that is funda-

mental to the following areas of mechanical engineering practice: machine design and manufacturing; opportunities to develop the ability to identify, analyze, and solve technical problems in the areas of machine design and manufacturing, using the principles of calculus, engineering science, and appropriate ICT technology; opportunities to learn how to plan, conduct, analyze, and interpret experiments and apply experimental results, using the principles of calculus, engineering science, and appropriate ICT technology; opportunities to apply creativity in the design of systems, components, or processes; opportunities for practical, hands-on learning; experiences in working together on teams; knowledge and practice in communicating through speaking, writing, and graphics, using appropriate ICT technology; information on professional, ethical, and social responsibilities and the importance of life-long learning; information on contemporary professional, societal, and global issues, as well as the nature and background of diverse cultures."

Control Engineering: "Ability to apply mathematics, science and engineering; ability to design and conduct experiments, as well as to analyze and interpret data; ability to design a system, component, or process to meet desired needs; ability to function on multidisciplinary teams; ability to identify, formulate and solve engineering problems; understanding of professional and ethical responsibility; ability to communicate effectively; broad education necessary to understand the impact of engineering solutions in a global and societal context; recognition of the need for, and an ability to engage in life -long learning; knowledge of contemporary issues; ability to use the techniques, skills and modern engineering tools necessary for engineering practice; ability to apply principles of engineering, basic science, and mathematics(including, multivariate calculus and differential equations); ability to model, analyze, design and realize physical systems, components and processes; ability to prepare students to work professionally in both thermal and mechanical systems."

Process Engineering and Environmental Protection: "M.Sc. Mechanical Engineers graduated in the specialization area for Process Engineering and Environmental Protection acquire necessary theoretical and engineering skills, modern approaches and methods to solve theoretical and practical problems. They are very well prepared to start a successful professional career, with possibility for further broadening of knowledge and gain more qualifications (professional exam, design license, construction works license, PhD studies). Mechanical Engineers graduated in the specialization area for Process Engineering and Environmental Protection on the basis of theoretical (fundamental) and practical knowledge (processes, operations and equipment) are able to solve specific problems in technical practice, and also to develop techniques and technologies in the field of industrial processes and production. Mechanical Engineers graduated in the specialization area for Process Engineering and Environmental Protection have enough formal knowledge and

qualifications to successfully perform activities and tasks in the field of: Design and development of processes and complex facilities in process and other industries; Design of process machines, devices and apparatus; Preparation and production management; Commissioning of process equipment, process lines and industrial plants; Maintenance of technical systems; Laboratory measurement, testing and certification of materials, products, machines and apparatus; Research and development in the field of theoretical and practical knowledge in process engineering and environmental protection; Teaching in high schools, higher education and universities; Organization and management."

Weapon Systems: "The main learning outcome of the Weapon Systems Module is education of designers of weapon systems. Learning outcomes are also abilities to model, analyze, test and design particular components of weapon systems. Student will be able to participate in multidisciplinary project teams and to successfully work in defense industry as well as in research and development institutions."

Thermal Power Engineering: "The educational objectives of the program are to produce graduates who can apply the principles of science and engineering, and are knowledgeable in thermal and mechanical systems. The students are educated to understand and investigate the relationships between thermal processes and thermal power equipment, to apply integrated designs, to communicate effectively and to demonstrate ability to function in multidisciplinary teams. Their skills include usage of modern engineering tools in design, investigation and analyses of processes, equipment and integral plants."

Material Handling, Constructions and Logistics: "By the end of the courses, students will be able to: Calculate the basic geometric properties of sections, calculate the bolted and welded connections and member forces of planar trusses; calculation of backhoe excavators, power shovels (front shovels), dragline excavators and loaders, calculation of working loads caused by soil excavation; load analysis of excavating device, static stability, calculation of loader, conceptual design of mini excavator, consultations; calculate the forces in sling devices, plan the basic values for lifting drive systems and for travelling drive systems of cranes; calculate the basic transport system and elementary subsystem performances; conduct the stiffness matrix for planar truss, analyze the truss structure with FEM and conduct the 3D model of simple gantry crane with linear finite elements; formulate the loads for beam and cantilever models, conduct the shear centre for thin-walled sections and calculate the shear and bending stress distribution; plan of advanced flexible transport, warehouse and logistics systems; calculate the belt and chain conveyors and evaluate material handling machines; calculation of working (excavating) equipment, operating modes, and power of mechanisms of excavators for continuous excavation, 3D modeling of characteristic subassemblies of excavators for continuous excavation, calculation models of truss substructures of bucket wheel excavators, computer simulations of

external loads, load cases, stress – strain identification, creation (development) of technical drawings, position determination, selection and calculation of basic (main) parameters of stackers (spreaders); plan the main dimensions of bridge crane, design the main girder and present technical documentation; conduct the environmental evaluation of product and use software tools for LCA power and strength of jaw and cone crushers and screens, dynamic models of backhoe excavators working devices, bulldozer barrier impact, calculation of basic technical (design) and technological parameters, power and strength of jaw and cone crushers and screens, analysis of excitation of bucket wheel excavators and trenchers, analysis of bucket wheel excavators steel structure response to excitation caused by soil resistance, modeling and response of carrying structures on wind excitation, fundaments of dynamics of mobile stackers (spreaders)."

Hydropower Engineering: "Fundamental knowledge in turbomachines; fundamental knowledge in fluid mechanics and thermodynamics; design of hydraulic and air systems (application of turbomachines); design and construction of turbomachines; Computational Fluid Dynamics; scientific flow measurements, Industry flow measurements."

Thermal Science Engineering: "The Thermal Science Engineering study curriculum provides the students with skills required for Heating Ventilating and Air Conditioning (HVAC) systems design and construction, for work in companies within the field of HVAC installations production, assembling, maintenance, and/or exploitation sectors, as well as for research and scientific work."

These intended learning outcomes are to some extend published in the brochure on "Mechanical Engineering @ University of Belgrade".

Analysis of the peers:

Generally the peers considered the great variety of specializations in mechanical engineering to be positive. They understood that these specialization tracks are labeled "modules" in the language use of the university (however they would suggest using the term "module" in the technical sense of comprehensive learning and teaching entity as it is usually employed in the context of the Bologna process). Also the peers appreciate the description of the learning outcomes of the different specialization tracks which are also available for students and other stakeholders online as well as in a paper version. Most of those learning outcomes are achievable, valid, and reflect currently foreseeable developments in the subject area. Some specializations as, for example, Information Technologies, Hydropower Engineering and Thermal Power Engineering, could be improved. However, the peers are missing the intended learning outcomes of the bachelor's and the master's programmes as a whole. Irrespective of the different specialization tracks aims

and learning outcomes of the bachelor's and the master's degree programme of mechanical engineering have to be specified. In this process it must be ensured that the intended learning outcomes of the programmes are connected in a coherent and consistent way with the learning outcomes of the specializations and the modules.

With the stipulated aims and learning outcomes of the programmes the University of Belgrade does not sufficiently classify the final degree in academic and professional terms. Due to the common description of aims and learning outcomes for bachelor's and master's degree programmes an allocation to a level of higher education institution degree within the European Qualification Framework is not possible.

Taking into account these precautions, the stated objectives and learning outcomes provided the peers with a reference for the evaluation of the programmes` curricula.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 2.1 Objectives of the degree programme
Criterion 2.2 Learning outcomes of the programme

The peers evaluated the requirements of the criterion as not sufficiently fulfilled yet. They found it indispensable that the intended learning outcomes of the programmes as a whole are specified and accessible to the relevant stakeholders. In this context also the coherent connection to the learning outcomes of the specific modules has to be obvious.

Assessment for the award of the EUR-ACE® Label:

The peers deemed that the intended learning outcomes of the degree programmes under review do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee Mechanical Engineering/Process Engineering. They considered the learning outcomes in the categories „Knowledge and Understanding“, „Engineering Analysis“, „Engineering Design“, „Investigations“, „Engineering Practice“ und „Transferable Skills“ to be fulfilled. Therefore, they do recommend the award of the EUR-ACE® label.

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

The **objectives of individual modules** are published in the course catalogue. The module descriptions are digitally available to student.

Analysis of the peers:

In general, the module descriptions are informative and precise. In particular, the learning outcomes are described sufficiently and transparently, thereby yielding a sound basis for the assessment of the students' and graduates' knowledge, skills and competencies. The stated objectives and learning outcomes provided a reference for the evaluation of the programmes' curricula and resources. However, the peers noticed the non-existence of the module descriptions of the bachelor's and the master's thesis.

It could be stated that the descriptions (and other relevant study information) are electronically available to students, teachers and other interested parties.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 2.3 Learning outcomes of the modules/module objectives

In general the peers concluded that the requirements of the criterion have been approached adequately. The module descriptions (bachelor and master thesis) should be completed.

B-2-4Job market perspectives and practical relevance

The university mentions the following job perspectives for the graduates:

"Graduates from the Faculty of Mechanical Engineering at University of Belgrade are always in great demand from employers in all the major industrial and commercial sectors, be it manufacturing, energy, oil field, automotive industry, Heating Ventilating and Air Conditioning and many other disciplines of mechanical engineering and not only that, many of our graduates work in information technology or even in finance."

Practical relevance of the programmes shall be achieved by:

The course "Skill praxis B" comprises for example: a tour around one or several laboratories, work in the laboratory, tour and work in certain industrial units (production and design centers) or factories, visits (excursions) to certain objects, etc.

Careers talks and workshops provide insights into specific careers and help with interview techniques, psychometric testing, business awareness, applications and time management. All of this is done with collaboration to University of Belgrade Centre for Career Development

Analysis of the peers:

In principle, the auditors gained the impression that graduates have a solid chance for finding employment in the mentioned fields and therefore the desired qualifications will allow a professional career in the respective areas. However, due to the current economic situation in Serbia, the demand is not as high as desired. The peers understood from the students that these also seek to work abroad.

Programme coordinators, teaching staff and students consonantly agreed to the impression of a certain disregard of the Bachelor degree in companies. May this be due to a lack of knowledge or to manifest doubts whether bachelor graduates dispose of professional competencies sufficiently, it certainly raises the awareness for all parts of study directly linked to professional practice. In this respect, an industrial placement as an obligatory element of the curriculum or a preliminary practical training as an admission requirement bears importance for acquiring fundamental competencies needed in professional work environments. However, the peers understood that practical placements are not obligatory due to the lack of companies offering traineeships in Serbia. The peers learned that this Bachelor's degree is rather considered as an intermediate state before enrolling in the Master's degree programme.

The peers acknowledged the effort to offer a training which is appropriately linked to professional practice. Virtual laboratories and the module "skills practice" seem to be the best possibility to impart knowledge in professional practice.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 2.4 Job market perspectives and practical relevance

The peers concluded that the requirements of the above mentioned criterion are met sufficiently.

B-2-5 Admissions and entry requirements

Chapter 6 of the statute stipulates the following admission and entry requirements:

"In the first year of study may enroll a person who has a high school education in four year duration and passes the entrance exam. […] The order of candidates for admission to the first year of study shall be determined on the basis of overall success achieved in secondary education and the results obtained in the entrance exam.

In the first year of master studies may enroll a person who has completed bachelor studies, achieving: At least 180 ECTS - if he enrolls master studies of 120 ECTS. […] The order of candidates for admission to the first year of master studies shall be determined on the basis of general average mark achieved at the bachelor level."

The Enrollment Info Booklet contains the following information regarding the entrance exam:

The entrance examination consists of 20 selected tasks belonging to the prescribed curriculum in mathematics for direction of mathematics and natural sciences in high schools.

The selection of candidates for admission to the first year of undergraduate studies is done on the basis of: a) the results obtained in the entrance exam, and b) the general success achieved in high school. The ranking list is compiled by the total number of points of each candidate according to the established way of scoring. A candidate can win a total of 100 points. At the entrance exam candidate can gain a maximum of 60 points (20 tasks x 3 points = 60 points). Under the term of general success in high school, it is meant the number of points calculated as the average score of all subjects in the first, second, third and fourth grade, multiplied by 2 (two). On this basis the candidate can acquire a minimum of 16 and a maximum of 40 points. […] An applicant may be registered in the status of budget financed student if he is ranked within the number approved for registration on the budget, which is published in the Call for competition and has more than 51 points. An applicant may be registered as a student who pays a tuition fee, if he is located in the rankings up to the number approved for the enrollment of students who pay tuition, which is published in the Call for competition, and has a total of more than 30 points.

Persons with disabilities can take an entrance exam in a manner suited to their capabilities. A person with a disability is required to explain in writing how the entrance examination has to be adjusted and to submit justification when applying.

Analysis of the peers:

The auditors discussed with the representatives of the university as to what extent the admission requirements have an impact on the quality of the degree programmes. In general, they found the admission requirements and procedure appropriate to serve this purpose. They gained the impression that the applicable regulations are transparent and accessible to all stakeholders involved. The entrance examination seems to only assess basic knowledge in mathematics, only a few enrollees fail this examination. But the peers understood that studying mechanical engineering is not the first choice of many students and the faculty seeks as many as possible. Altogether the peers found that the admission

requirements are reasonable for maintaining the quality of the Bachelor´s degree programme.

Regarding the Master's degree programme the peers took note of the fact that students have first to graduate from a Bachelor's degree before they can enrol into the Master's degree programme. The peers discussed the consequences of the fact that all students who have completed bachelor studies with 180 ECTS are accepted in Master's degree. In their opinion this requirement makes it difficult for the university to ensure the requested level of the Master´s degree programme. The peers learned that according to the law of Serbia the faculty does not have the possibility to demand admission requirements beyond that. But they also understood that in practice no problem arises: There are only very few enrollees coming from other universities or other faculties. If prerequisites are missing the departments will individually decide if any compensating bachelor courses are necessary in order to pass the degree programme. In praxis the peers found that the admission procedure is reasonable for maintaining the quality of the Master´s degree programme.

The peers discussed with the university's representatives the recognition of qualifications gained at another institution of higher education, in particular abroad. In the Statute of the university they found that, so far, no particular rules are in place referring to the recognition of competences achieved in other HEIs. In principle, such regulation is meant to encourage and support the mobility of students as a pivotal part of the Lisbon Convention (see in particular: Section III "Convention on the Recognition of Qualifications concerning Higher Education in the European Union"). The university representatives described the process they have in place if a student desires to go abroad for one or more semester. The peers understood that before the student is going abroad a learning agreement is signed that ensures that the selected modules at the other higher education institution and subsequently the qualifications gained can be recognized. Nevertheless the peers learned in the course of the conversation with the students that in some cases the recognition of activities raises difficulties. The peers have the notion that rules for the recognition of activities completed at other HEIs have to be adopted.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 2.5 Admission and entry requirements

The peers judged the said criterion as being addressed adequately. With regard to the recognition of activities completed at other HEIs or at institutions/learning environments other than HEIs they stated that rules for the recognition of activities have to be adopted

("Lisbon Convention") especially with view to internationalization and, in particular, the mobility of students.

B-2-6 Curriculum/content

Hours weekly	1st year		2nd year		3rd year	
	1st	2nd	3rd	4th	5th	6th
1 2 3 4 5	Mathematics 1	Mathematics 2	Mathematics 3	Thermodynamics B	Fluid mechanics B	Electrical and electronics engineering
6 7 8 9 10	Mechanics 1	Basics of strength of constructions	Mechanics 2	Mechanics 3	Numerical methods	Control engineering
11 12 13 14 15	Constructive geometry and graphics Strength of materials	Engineering graphics	Machine elements 1	Machine elements 2	Manufacturing technology	Elective course 6.3.5
16 17 18 19 20	Physics and measurements	Engineering materials 1 Basics of sociology and economics	Engineering materials 2	Elective course 4.4.5	Elective course 5.4.5	Elective course 6.4.5
21 22 23 24 25	English 1 Programming	English 2 Computational tools	Elective course 3.5.5	Mechanical engineering praxis	Elective course 5.5.5	Final course with a report (B.Sc. work) 6.5.5
				Elective Skill praxis B 4.8		

Hours weekly	1st year		2nd year	
	1st	2nd	3rd	4th
1	COURSE OF ELECTIVE MODULE 1.1.5	COURSE OF ELECTIVE MODULE 2.1.5	COURSE OF ELECTIVE MODULE 3.1.5	Master (M.Sc.) thesis (Diploma work) 4.9
2				
3				
4				
5				
6	COURSE OF ELECTIVE MODULE 1.2.5	COURSE OF ELECTIVE MODULE 2.2.5	COURSE OF ELECTIVE MODULE 3.2.5	
7				
8				
9				
10				
11	Mechanics M or Fluid mechanics M 1.3.5	COURSE OF ELECTIVE MODULE 2.3.5	COURSE OF ELECTIVE MODULE 3.3.5	
12				
13				
14				
15				
16	Thermodynamics M or Mechatronics 1.4.5	Elective course 2.4.5	Elective course 3.4.5	
17				
18				
19				
20				
21	Elective course 1.5.5	Elective course 2.5.5	Elective course 3.5.5	
22				
23				
24				
25				
		Skill praxis M of elective module 2.8		

Analysis of the peers:

The auditors found that that the curricula of the degree programmes in principle correspond to the intended learning outcomes, taking into account the need for a more specified written description of the qualification profiles. They saw that objectives and content of the individual modules are coordinated in order to avoid any unintended overlaps. In general, the peers were convinced of well-founded study concepts, notably the curriculum of the bachelor's programme is considered positive: The strong theoretical basis in the curriculum with mathematics and basic engineering sciences is appreciated by the peers.

The peers discussed with representatives of the university the selection of non-compulsory modules in the master's programme in the light of the achievement of the stated learning outcomes. The peers got the impression that due to the big variety it is possible to select modules in order to find an "easy way" to pass the degree programme. The peers recommend taking measures to ensure an adequate study plan at the begin-

ning of the studies to achieve the desired learning outcomes (cf. B 3.3 educational methods).

By means of a thorough assessment of the curriculum the peers gained the impression, that soft skills are underrated. The teaching staff emphasized that they encourage students to apply for students competitions where they also have to work in teams. Additionally, knowledge in business administration is imparted in the study programmes. However, in order to enhance the competencies of students in those fields of learning, which the auditors believe to be an integral part of a study programme, the curriculum of the degree programmes should be adjusted accordingly (e.g. team work should be institutionalized in several courses).

When viewing the samples of final projects and exam papers provided by the university, the auditors gained the impression that they reflect the aspired qualification level.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 2.6 Curriculum/content

The peers deemed the requirements of this criterion being fulfilled to a large extent, but not yet sufficiently for the soft skills. The peers recommend strengthening the integrated soft skills of the students.

For the award of the EUR-ACE® Label:

The peers deemed that the curricular content is suitable to achieve the intended learning outcomes. Therefore, they recommend the award of the EUR-ACE® label.

B-3 Degree programme: structures, methods and implementation

B-3-1 Structure and modularity

The courses have the following size: Each course lasts one semester with 5 hours per week, which equals 6 ECTS. Exceptions are: Skill praxis (internship, training, practice) B – minimum 46 hours of student's independent work equals 1 ECTS; mechanical engineering praxis – equals 5 ECTS, M.Sc. thesis equals 29 ECTS. If courses are organized in blocks: a course (block) with 3 teaching hours corresponds to 4 ECTS, and a course (block) with 2 teaching hours to 2 ECTS.

European exchanges take place under Tempus and Socrates Programmes of the European Commission. As the Faculty fully implements the European Credit Transfer System, qualifications gained at the Faculty of Mechanical Engineering are recognized and understood in other European countries, and vice versa.

Analysis of the peers:

The audit team found that the ASIIN-criterion for modularization is met.

The peers discussed with the representatives of the university the numerous specializations in the master's programme. They understood that all the specialization tracks are offered in Belgrade for historical reasons. All tracks are conducted every year. The students can indicate three specializations and the best students are allowed to enroll in their first choice.

As already mentioned above, the peers took note of the procedure regarding the possibility to spend some time abroad without loss of time, i.e. the recognition of qualifications gained abroad. Although the peers found that regulations concerning this matter should be adopted they learned that the number of students spending time abroad is rising steadily. The teaching staff emphasized that they offer information on possibilities going abroad regularly. The peers conclude that, generally, there are opportunities for study visits at other HEIs ("mobility window") and they are integrated into the curriculum in a reasonable way. The Faculty is encouraged to continuously further improve the mobility of the students, as this is seen as an important part for European integration.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 3.1 Structure and modularity

The peers considered the requirements of the said criterion as sufficiently met already.

B-3-2 Workload and credit points

According to the institution, 1 ECTS credit equates to 25 – 30 hours of student workload.

Each semester is composed of 30 ECTS on average.

Analysis of the peers:

The audit team found that the ASIIN-criterion for the award of ECTS credits is met. Nevertheless, they questioned if an evaluation of the actual workload has been conducted in

order to assess if the ECTS credits correspond to the actual workload. Mostly the courses/modules comprise 6 ECTS, independently from the complexity of the contents. The peers got the impression that the workload is basically in line with the given ECTS credits. However, it seemed that students have not yet been asked for their actual workload. Therefore, the peers recommend collecting data on the workload in order to evaluate if the credit points are allocated accordingly (c.f. 6.2).

The peers discussed with the representatives of the university if the projected time budgets are realistic, so that the programme can be studied within the standard period of study for the degrees. They found out that only 30 percent of the bachelor students and 20 percent of the master students succeed their study programme within the standard period of study. 40 percent of the bachelor students quit the university without having an exam. The peers learned that a relatively large number of students leave the studies before finishing because of economic reasons. Also a part of the students becomes aware that they did not properly select a faculty they wanted to study and therefore change their study programme. In the course of the conversation with the students the peers learned that they assess the workload as suitable. They are convinced that it is possible to complete the program of study within the stipulated time.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 3.2 Workload and credit points

The peers considered the requirements of the criterion fulfilled generally. Still, they recommend to regularly evaluate the allocation of credit points in the course of quality assurance processes and to alter the assignment of credit points if necessary.

B-3-3 Educational methods

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

Lectures and presentations are given by the professor in the classroom or laboratory. A recommendation of the technical faculties is: „For each lecture a handout material, printed or hand-written, must be delivered to students to the extent of 6-8 pages per two hours of teaching class“; analysis and explanations of material; class exercises (oral, auditorial, with and without calculation examples) – Repetitorium; guidelines for seminar work; guidelines for design projects; guidelines for laboratory exercises; execution of laboratory exercises; discussions and workshops; practical work; excursion; consultations.

Options for elective modules are available:

In the Bachelor's Degree Programme: Just before the start of 3rd, 4th, 5th and 6th semester, the student chooses elective courses which he wants to attend and pass exams in. For each semester, as well as for each position of a course in a certain semester, a separate list (menu) of courses exists. If the student chooses courses completely voluntarily, the Diploma Supplement will not state any of the specialization areas. If the student chooses courses obeying to conditions prescribed by certain departments (specialization areas) regarding the courses recommended for choice, the Diploma Supplement will state the specialization area obtained.

In the Master's Degree Programme: When enrolling in M.Sc. studies, it is obligatory for the student to choose one elective specialization area.

Analysis of the peers:

The auditors gained the overall impression that the teaching methods used for implementing the didactical concept support the attainment of the learning objectives. The peers learned that the teaching staff tries to integrate many experiments and projects in the courses due to the fact that the laboratories are in some cases not very well equipped.

The peers appreciated the range of compulsory elective subjects that allows students to develop an individual focus. They learned that all the specialization tracks are conducted every year. The teaching staff informs the bachelor students about the different specializations so that they have an idea about what to choose in the master's programme. As the peers got the impression that it is possible to select modules in order to find an "easy way" to pass the degree programme, they recommended taking measures to ensure an adequate study plan at the beginning of the master's studies to achieve the desired learning outcomes. An individual study plan could be approved by the tutors to which the professors could give his or her recommendation.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 3.3 Educational methods

In view of the peers, the educational concept complies with the requirements of the respective criterion. But they recommend improving the support and supervision of the adequate choice of courses to assure that all students achieve the intended learning outcomes.

B-3-4 Support and advice

Offers for support and counseling of students are provided as described below:

All professors and assistants are available for individual and group consultations. Prospective students can use the possibilities of the open day to inform themselves about the study programmes.

Analysis of the peers:

The audit team saw sufficient resources to guarantee support and counseling for students. In the discussion with the students they found out that the students are satisfied regarding the support from the university. They mentioned in this regard in particular their mentor. They also acknowledged that teaching staff is available in case of questions or problems. The auditors gained the impression that both staff and students are very highly committed in the curricular activities and that good relationships exist between students and staff.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 3.4 Support and advice

The peers find the said criterion to be fully met by the counseling concept of the faculty (regarding the supervision of the adequate choice of courses see B 3.3 Educational methods).

B-4 Examinations: system, concept and organisation

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

The professor is obliged, at the beginning of the course, to acknowledge to the students the program of the course, the schedule of the course by teaching weeks or days, kinds of active teaching process (before-exam obligations) and the way of their evaluation (grading), with the character and contents of the exam, list of fields and/or questions for the exam, with structure of total number of points and the way of grade determination. The type of examination is laid down in the module description for each module.

The outline of the schedule of examinations for all examination periods is announced and published at the start of each school year. Examinations are organized in: January, April, June, September and October, and are organized in accordance with the annual plan of

examinations of the Faculty. Additional examination period is organized, usually before the next academic year.

A student who has met all required prerequisites given in the teaching plan can get the examination. By finishing all of the before-exam obligations and by passing the exam, the student can get 100 points maximum, where before-exam obligations may contribute at least 30, and at most 70 points. The number of exams in the final semestral exam period (January or June) is always 5. However, if with block courses, then the exam for the first block-course is held earlier, and only the second block is scheduled for the final semestral exam period.

Exam in the same subject can be taken up to three times during the school year. Exceptionally, a student who has left over only one exam of a study program he has entered, has the right to take that exam in an additional examination period prior to the start of the next academic year. Students, who do not pass the exam in a compulsory subject until the beginning of the next school year, must enroll in the same subject again. A student who has not achieved 37 ECTS enrolls the same year degree program.

Application for the exam is submitted in writing on the appropriate form or electronically after the expiration of the previous exam period, at least ten days before the exam period. The Office for student affairs of the University or Faculty, at least five working days after the deadline for exam applications, makes preliminary lists of students who applied with remarks on their validity. Eventual corrections (withdrawal of the application, late submissions, etc.) are done in two days period after the announcement of preliminary lists.

For the handicapped students who are not able to make the examination neither orally nor in writing, the University or Faculty will provide the appropriate way.

For the bachelor thesis the student has to complete a final report (design project or seminar work) and to defend it.

The master thesis is to be taken with a supervisor from the pool of professors of obligatory courses of the elective courses the student has passed, where the menu of such courses is defined by departments leading the module. M.Sc. thesis must contain at least two of the following fields: material on the topic studied and analyzed, self-performed numerical calculation, self-done laboratory work, and/or self-performed mechanical design. Thesis defense cannot be done unless all the exams are passed.

Analysis of the peers:

The peers gained the impression that type, organization and distribution of examinations are designed to support the attainment of the intended learning outcomes by the time the degree is completed. Written and oral examinations are scheduled. The peers also learned that students are informed at the beginning of the teaching term about the examination requirements. In light of many before-exam obligations (e.g. laboratory work) the peers nevertheless questioned the number of exams every student must pass. They were informed by the teaching staff and the students as well that the multitude and variety of exams is considered to assess the learning achievements of students continually and comprehensively. The students appreciated the number of exams.

Although the bachelor thesis is rather a small project work that comprises only 6 ECTS, the auditors gained the impression from the selection of final projects and exam papers provided by the university that the intended learning outcomes in the respective study programme were met.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 4 Examinations: system, concept and organization

The peers found the requirements of the aforementioned criterion being met.

B-5 Resources

B-5-1 Staff involved

According to the university the teaching staff is composed of 79 full professors, 43 associate professors, 28 assistant professors, 67 teaching assistants, 2 lecturers, 52 researchers, 32 laboratory personnel and 131 administrative personnel.

In spring semester of academic year 2011/12 the Faculty of Mechanical Engineering is participating in 60 scientific and research projects funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia:

- 13 projects in the field of fundamental (basic) research;
- 25 projects in the field of technological development;
- 8 projects in the field of energy efficiency;
- 14 projects in the field of III (integrative interdisciplinary research).

At the same time, the Faculty of Mechanical Engineering participates in 13 international projects:

- 5 EUREKA projects;
- 5 FP7 projects;
- 2 TEMPUS projects;
- 1 HERD project.

Analysis of the peers:

The auditors considered the composition and qualification of the staff to be adequate in order to facilitate the achievement of the objectives of the degree programmes. They are astonished at the very high staff resources. The auditors gained the impression that the staff is highly committed in the curricular activities.

The peers learned that the teaching staff has the opportunity to have research sabbaticals, but that very few make use of this opportunity. The peers understood that attending relevant conferences in the field of research is hardly financially supported by the university or the ministry, so that in particular young researches have problems to attend internationally relevant conferences. But all in all the characteristics of the research and development activities of the teaching staff support the desired outcome level of the programmes from the auditors' point of view.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 5.1 Staff involved

The peers considered the requirements of the criterion as satisfactorily addressed.

B-5-2 Staff development

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

University courses on didactics, pedagogy, andragogy, methodology, psychology, etc. are offered. Also there is a separate plan for development of young researchers (teachers).

Analysis of the peers:

The auditors noted that all of the teaching staff members have sufficient possibilities to develop and train their didactic and professional skills (also in cooperation with the fac-

ulty of philosophy). They appreciate that in particular the younger teaching staff is requested to take part in such further education.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 5.2 Staff development

The peers considered the requirements of the said criterion as already met by the universities human resources policy.

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

The Faculty is managed by its bodies: The Faculty council with its President, the Dean, the Vice-deans for teaching process, finances and research and business and 24 chairs.

In the brochure on "Mechanical Engineering @ University of Belgrade" the payments done by the ministry of education, the ministry of science and the industry are stated.

The buildings used by the faculty of mechanical engineering are: a new building, an old building, a wind tunnel building and a steam power substation building. They comprise 30 lecture rooms, 4 amphitheatres, 3 celebration rooms, 4 rooms for numerical laboratories, 30 laboratories, 118 offices and 2 internet alleys with 30 free access places.

The Library is situated at the Faculty building and is open from 9am to 5pm weekday, during semesters. The Library has over 100,000 books and periodicals and 200 reading spaces available for both group-work and individual study. It is the full member of the library information system COBISS since 2004, within which it uses software for cataloging and automation of the entire library operation. By this work and connection through COBISS, the full possible involvement into the National Library and Information System is provided, with online search and access to scientific databases, and online information on the availability of individual specimens. Through KoBSON (On-line consortium of Serbian libraries for coordinated scientific information acquisition) a large number of international scientific journals are available to the users of the library, in forms of abstracts or full-text, or as electronic books, with databases of citations.

All students are issued with a computer username and password when they join the Faculty; this allows them to use one of 500+ PCs (32 of them in Web-Sokak are available from 8am to 8pm every day, 7 days a week). The latest versions of subject-specific software are provided, including statistics (Matlab) and engineering drawing and modeling packages (AutoCAD, CATIA, SolidWorks, ProEngineer, etc). Students have access via the Internet to

the Web and e-mail. Students can also connect to eight powerful computers for parallel computing at SimLAB. From their rooms at the dormitories students can access all the above services.

Analysis of the peers:

The peers discussed the financial situation with the representatives of the university. They learned that they obtain funds from the ministries in an amount up to 60 percent and from the industry up to 40 percent.

During the exemplary visitation of some of the laboratories which are in use for educational purposes, the peers judged these to be predominantly basic and, in general, adequate. Regarding the technical equipment for laboratory exercises the peers learned that funds have been allocated to update the laboratory equipment. They appreciate this information because they saw room for improvement in order to achieve the objectives and intended learning outcomes. Regarding engineering practice, in particular, the peers recommended to continuously refurbish the laboratory equipment and to replace out-dated apparatuses and machinery. The peers emphasised that an equitable distribution of the additional funds is important. In the course of the conversation with the students the peers learned that the library and the rooms are sufficient. But the students emphasized that there is a lack of licences for special software programmes such as Matlab.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 5.3 Institutional environment, financial and physical resources

The peers came to the conclusion that, overall, the resources are satisfactory to facilitate the achievement of the stated objectives for each of the degree programmes to be accredited. Nevertheless, from their point of view, they recommend to continuously refurbish the laboratory equipment and to replace out-dated apparatuses and machinery. Additionally sufficient software licenses should be available.

B-6 Quality Management: further development of degree programmes

B-6-1 Quality assurance and further development

The quality assurance system at the Faculty of Mechanical Engineering is defined by the Statute of the Faculty. Teaching Assembly of the Faculty adopted the document "Rules and procedures for quality assurance" and formed a Commission for quality assurance. The Commission staff comprises representatives from teaching and non-teaching staff, as well as student representatives. The Commission organizes, coordinates and implements evaluation procedures for confirming compliance with the standards of quality in the Faculty of Mechanical Engineering. In its work, the Commission is guided by the quality of the idea of establishing and improving internal institutional mechanisms for assurance, validation and improvements of quality, with the aim of ensuring a permanent high professional standard and professional development of participants in all areas of Mechanical Engineering. The Quality Commission monitors the implementation of the Strategy for Quality Assurance, monitors compliance with Quality Standards, recommends standards and procedures for quality assurance, proposes measures to remedy identified weaknesses in order to improve the quality, performs other duties relevant to the promotion and development of quality. Commission on quality assurance cooperates in its work with the corresponding commission on university level. Final decisions on quality issues are made by the Teaching Assembly of the Faculty of Mechanical Engineering.

A special form of teaching process quality check is ensured by regular surveys of the students. The questionnaire for the evaluation of the teaching staff is conducted each year in regular periods in the teaching process during last two weeks in a semester in which the teaching is being finished for a certain subject. The Commission reports the results of the survey process to the Teaching Assembly of the Faculty. At the end the overall average grade for an evaluated member of the teaching staff is given. The grade expresses the opinion of students on pedagogical work (performance) of the teacher, which is to be taken into account when election to a certain position comes. The Report is passed to the Education and Scientific Council of the Faculty for discussion and adoption.

Analysis of the peers:

With regard to the development and continuous improvement of the aforementioned degree programmes, the auditors considered the quality management concept. Apparently, the means for quality assurance have been found useful as a reliable benchmark for

substantially checking whether the intended objectives are achievable and reasonable, and for identifying any failure in achieving those objectives.

In the discussion with the students the audit team got the impression that feedback loops are effectively in practice and the students are satisfied with instruments put in place in order to collect their feedback. The students emphasized that they always have the possibility to address themselves to the teaching staff and that they are involved in the further development of the study programmes. However, the peers learned that surveying graduates and alumni, which the auditors believe to be very important, is up to now not an integral part of the quality assurance system. The data gathered could be used to provide information about student employment upon completing their degrees and allow conclusions to be drawn as to whether a programme can be successfully completed. Also the peers got the impression that an evaluation of the actual workload has not been conducted regularly in order to assess if the ECTS credits correspond to the actual workload.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 6.1 Quality assurance and further development

The peers found that the requirements of the said criterion have been met sufficiently. Still, they recommend to further implement the quality management concept (collecting data on the workload in order to evaluate if the credit points are allocated accordingly, surveying graduates and alumni) and to use the data collected for continuous improvement.

B-6-2 Instruments, methods & data

The Faculty provides an overview of numbers of students enrolled to the study program by years of study in school year 2011/2012, statistical data on student success rate on study programs in school year 2011/2012, an overview of number of students who graduated in previous three school years and success rates in different courses.

The faculty provides also a summary on the results of student evaluations of pedagogical work of teachers in the winter semester of school year 2011-2012.

Analysis of the peers:

The peers found that the quality and quantity of the collected data and its analysis are suitable to provide information about the average time needed to complete the programmes. The data analysis also provided information about the entry positions of the

graduates and the effectiveness of means to avoid possible inequalities within the institution. The quality management system puts those responsible in a position to discover and remedy weaknesses.

The peers saw that the university obviously does not conduct a review of the actual student workload in order to examine whether the given ECTS credits are reflecting the actual workload. Furthermore, with view to the employment success of graduates, they recommend pursuing systematically respective surveys in order to extract relevant information as to whether study objectives and quality expectations of the university are fulfilled.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 6.2 Instruments, methods & data

In principle, the peers considered the requirements of the said criterion as met. However, the peers recommended to further implement the quality management concept and to use the data collected for continuous improvement. The collection of data should also include the actual workload.

B-7 Documentation and transparency

B-7-1 Relevant regulations

The regulations mentioned below have been provided for assessment:

- The Statute of the Faculty of Mechanical Engineering (put into force)
- The rules on examination procedure and grading of the exam (put into force)
- The rules on student's evaluation of pedagogical work of teaching staff (put into force)

Analysis 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.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 7.1 Relevant regulations

The peers concluded that the requirements of the criterion are met in general. Critical points referred to in other chapters of this report, which may affect them, notwithstanding.

B-7-2 Diploma Supplement and qualification certificate

A Diploma Supplement in Serbian language is issued.

Analysis of the peers:

The auditors discovered that, as yet, no sample of English language Diploma Supplements have been produced providing information about the programme specific study objectives, indented learning outcomes, structure and level of the respective programme, the success of the graduate, as well as the composition of the final grade. Furthermore, statistical data in addition to the final mark according to the ECTS User's Guide or any regulation concerning the comparability of the individual final grade in the European Higher Education Area (EHEA) are not foreseen. Such data may assist in interpreting the individual degree and should be added to the Diploma Supplement.

Assessment of the peers:

For the award of the ASIIN seal

Criterion 7.2 Diploma Supplement and qualification certificate

The peers deemed the requirements of the above cited criterion as not fulfilled yet. They came to the conclusion that an English language Diploma Supplement has to be provided. In addition to the final mark statistical data have to be provided in accordance with the ECTS User Guide of 2009.

C Additional Information

not necessary

D Comment of the HEI (01.05.2013)

The institution provided the following statement:

„...