



**REPORT
OF THE EXPERT PANEL
IN THE PROCEDURE OF INITIAL ACCREDITATION OF THE
STUDY PROGRAMME
University undergraduate study programme in *Mechatronics
and Robotics*, University of Rijeka, Faculty of Engineering**

Date of accreditation:

7 May 2024

May, 2024



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INTRODUCTION

The Agency for Science and Higher Education (the Agency) is an independent legal entity with public authority, registered in the court register, and a full member of the European Quality Assurance Register for Higher Education (EQAR) and the European Association for Quality Assurance in Higher Education (ENQA).

All study programmes delivered by public and private higher education institutions are subject to the initial accreditation of study programmes, a procedure conducted by the Agency in accordance with the Act on Quality Assurance in Higher Education and Science (Official Gazette 151/22) and by following *the Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) and good international practice in quality assurance of science and higher education.

The Agency's Accreditation Council appointed an independent expert panel for the evaluation of the University undergraduate study programme in Mechatronics and Robotics, University of Rijeka, Faculty of Engineering.

Members of the Expert Panel:

- Prof. Vadim Silberschmidt, PhD, Loughborough University, School of Mechanical, Electrical and Manufacturing Engineering, United Kingdom of Great Britain and Northern Ireland, Panel chair,
- Prof. Geza Husi, PhD, University of Debrecen, Faculty of Engineering, Department of Vehicle Engineering and Mechatronics, Department of Electrical Engineering and Mechatronics, Hungary,
- Prof. Zdenko Kovačić, PhD, University of Zagreb, Faculty of Electrical Engineering and Computing, Republic of Croatia,
- Assoc. Prof. Šandor Ileš, PhD, University of Zagreb Faculty of Electrical Engineering and Computing, Republic of Croatia,
- Antonio Antunović, student, Josip Juraj Strossmayer University of Osijek, Faculty of Electrical Engineering, Computer Science and Information Technology Osijek, Republic of Croatia.

The Expert Panel held meetings with the following groups:

- Management,
- Head of the study programme,
- Full-time teaching staff that will participate in the delivery of the study programme,
- Representatives of the business sector, potential employers.



The Expert Panel visited the laboratories, the library, the student administration office and the classrooms.

The Expert Panel drafted this Report on the initial accreditation of the study programme University undergraduate study programme in *Mechatronics and Robotics*, University of Rijeka, Faculty of Engineering, based on the Proposal of the Study Programme University undergraduate study programme in *Mechatronics and Robotics*, University of Rijeka, Faculty of Engineering, other relevant documents and the site visit.

The Report contains the following elements:

- Basic information on the study programme,
- Detailed analysis of each quality standard, recommendations for improvement and quality grade for each standard,
- Final recommendation of the Expert Panel,
- Appendices (quality grade summary by each assessment area and standard and the site visit protocol).

In the analysis of the documents, site visit and meetings held at the University of Rijeka, Faculty of Engineering, and writing of the Report, the Expert Panel was supported by:

- Matan Čulo, coordinator, ASHE,
- Ivana Rončević, translator of the Report, ASHE.



BASIC INFORMATION ON THE STUDY PROGRAMME

Name, seat and OIB (Personal Identification Number) of higher education institution: University of Rijeka, Faculty of Engineering, OIB: 46319717480

Name and type of study programme:

University undergraduate study programme in Mechatronics and Robotics

CroQF/EQF/QF-EHEA level: CroQF: 6.sv / EQF: 6 / QF-EHEA: 1

Scientific or artistic area and field of study programme:

Scientific field: Technical Sciences, Field: Interdisciplinary Technical Sciences

ISCED FoET classification: Engineering and technology

Programme duration: 3 years

Number of ECTS points acquired on completion of study programme: min 180

Academic or professional degree / qualification obtained upon the completion of the study programme (if the study programme has several specializations, the issued degree/qualification cannot be named according to the specialization, but at the level of the study programme):

Bachelor of Science (BS) in Mechatronics and Robotics (univ. bacc. ing. mech.)

Language of delivery: Croatian

Place of delivery of the study programme (at the head office or outside the head office of the higher education institution):

University of Rijeka, Faculty of Engineering, Rijeka

Method of delivery of the study programme: in-person

Admissions quota (for full-time and part-time students): 30 + 10

Academic year in which the study programme delivery is to commence: 2024/25



In case of joint programmes delivered by Croatian higher education institutions, please include a list co-providers/partners:

THE EXPERT PANEL'S RECOMMENDATION TO ASHE'S ACCREDITATION COUNCIL

1. to issue a licence

DETAILED ANALYSIS OF EACH STANDARD, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE

I. Internal Quality Assurance

1.1. Clear justification for the introduction of the new study programme has been provided with regard to the mission and strategic goals of the higher education institution, as well as economic and societal needs.

Analysis:

During the meeting, the programme director highlighted the distinct features of the proposed programme, although its similarity to the one offered at the Faculty of Mechanical Engineering and Naval Architecture (FAMENA) at the University of Zagreb was also mentioned. Notably, the emphasis on electrical engineering and a higher extent of the use of computer sciences, automation as well as more elective courses sets it apart from the programme in Zagreb. This led the Panel to conclude that the programme is specific and that there is no full overlap between the two programmes. While developing the programme, the Faculty also considered the existing courses in Scandinavia and the USA.

A concise economic rationale of the suggested programme for Primorje-Gorski Kotar County was presented. The Croatian Employment Service stated that the proposed study programme aligns with labour market demands, a sentiment reaffirmed during discussions with external stakeholders. The matter of employability of the graduates was discussed, with representatives of industrial companies providing multiple examples of demands and potential for employment. These demands defined the introduced quota that would be monitored. Market analysis was used to underpin the programme development; surveys performed among the high-school students were used to better understand the needs for the suggested programme.



It was demonstrated that the Faculty already has provision for all scientific fields integral to mechatronics, with prior experience in related courses. Moreover, the programme aligns with the HEI's mission, strategic objectives, and national-level strategic documents, including the Smart Specialization Strategy (S3) until 2029. Its minimal requirements are comparable with those of similar programmes at other Croatian universities.

Based on the multidisciplinary projects shown in the tour, the Panel is convinced that the admission quotas are aligned with the scientific needs of the Faculty.

Recommendations: None

Quality grade: Fulfilled

1.2. The study programme has undergone an appropriate internal quality assurance process and has been formally approved by the higher education institution.

Analysis:

The Faculty has published a quality assurance policy that encompasses all aspects of education and relevant aspects of research, making it publicly available online.

The study programme has undergone internal quality assurance involving both internal and external stakeholders. These include members of the working group for the programme's development, representatives from the Faculty Council, as well as external stakeholders such as employers and students.

Comprehensive research of current trends and needs was conducted, along with a detailed examination of analogous programmes in Europe and the United States. These efforts were accompanied by discussions with distinguished scholars from foreign universities.

The new programme was approved by the Council of the Faculty of Engineering of University of Rijeka during its 8th (electronic) session in the academic year 2023/2024, concluding on February 28th, 2024. (The decision of the Faculty Council of the Faculty of Engineering is included as Additional Annex 6).

Recommendations: None

Quality grade: Fulfilled



1.3. The higher education institution will collect, analyse and use relevant data for the effective management and continuous enhancement of the study programme in accordance with the published quality assurance policy.

Analysis:

The programme management is aligned with the quality assurance policy of the Faculty. Quality of the proposed study programme will be monitored through key indicators with target values and projected deadlines. These indicators include reorganizing the Faculty's units within the first year, accrediting the study programme by June 2024, enrolling first-year students in the University undergraduate study programme in Mechatronics and Robotics in the first, second, and third years, tracking the number of students completing the programme after three years, assessing the average study duration, evaluating student employability after four years, periodically procuring additional equipment, completing energy renovation of the building by the end of 2025, and conducting periodic evaluations of student satisfaction.

Student surveys are planned to be used for assessment of the quality of content and teaching methods in delivered courses, including the alignment of teaching methods, learning methods, and course ECTS credits.

The monitoring process in the Faculty already uses the data on the programme duration, completion rate and dropout rate for the existing study programmes and will be applied for the suggested programme.

Mechanisms of amending and supplementing study programmes are initiated in accordance with the Regulation on the Quality Assurance and Enhancement System of the Faculty of Engineering of the University of Rijeka.

The monitoring plans and mechanisms are publicly available for all the programmes that are delivered by the HEI.

Recommendations: None

Quality grade: Fulfilled



1.4. The higher education institution informs the public about the study programmes it offers, as well as plans to offer new programmes, i.e. change made to existing ones.

Analysis:

According to the Initial accreditation procedure application form - study programme (hereinafter: Application form), the Faculty publishes clear, well-organised, up-to date, easily searchable and publicly available information on their website and using other media. From the presented information the HEI informs the public on the admission requirements, intended learning outcomes, teaching and assessment methods and qualifications to be gained, together with the opportunities they will have to continue their studies or find employment. The Faculty regularly organises Open Laboratory Days for potential students that provide information on all the mentioned matters.

Recommendations: None

Quality grade: Fulfilled



II. Study programme

2.1. The proposed study programme is compatible with the qualification standard entered in the Croatian Qualifications Framework Register.

Analysis:

The Register of the Croatian Qualifications Framework (CQF) has no qualifications related to the proposed study programme in *Mechatronics and Robotics*. However, some learning outcomes from the CQF related to *Computer science*, *Electrical engineering* and *Information technology* are applicable to the proposed study programme and will be included in the curriculum through respective courses.

Recommendations: It is recommended that the Faculty takes measures to register the qualification standard in the Croatian Qualifications Framework Register.

Quality grade: N/A

2.2. The intended learning outcomes at the level of the study programme are aligned with the competences a student should gain by completing the study programme, as well as with the CroQF and EQF level.

Analysis:

The Faculty of Engineering in Rijeka (HEI) already conducts university undergraduate study programmes in *Mechanical engineering*, *Electrical engineering*, and *Computer science*, and the intended learning outcomes (ILO) of the proposed University undergraduate study programme in *Mechatronics and Robotics* represent a cross-section of selected ILOs expanded with basic learning outcomes from the fields of mechatronics, robotics, control, automation and artificial intelligence. The programme was developed considering the *Guide for the Use of ECTS*, published by the European Commission and the Ministry of Science and Education.

Industry stakeholders were consulted to ensure that the ILOs align with industry requirements and the needs of the labour market. As a result, the ILOs of the proposed study programme were introduced using three main categories: Fundamental knowledge (3 ILOs), Specialist competencies (3 ILOs) and Applied skills (3 ILOs). As the knowledge of mechatronics and robotics requires knowledge and skills in mechanics, programming, electronics and control, the intended learning outcomes of the study programme are well aligned with the competences that a student should acquire after completing the programme.



The Panel concluded that the University of Rijeka has taken care not to overburden students by carefully selecting the learning outcomes most needed for this interdisciplinary area. The programme in its current form is contemporary and comparable to existing programmes in the Republic of Croatia and EU member states.

The intention of the HEI was to offer students the opportunity to acquire micro-qualifications by taking appropriate groups of electives from the programme, thus making the programme more versatile and specific. During the meeting with industry stakeholders, the concept of micro-qualifications was widely accepted as a concept that could be beneficial for Rijeka County and neighbouring counties.

In parallel with professional ILOs delivered in multiple professional courses, the programme has a provision of key and general competencies by providing, for example, mathematical courses in the first and second years. The students will also acquire various transferable skills, including participation in the course *Professional Practice*.

Recommendations:

It was noted that there are only two courses directly focused on mechatronics and one on robotics. The Panel members recommend considering further development of the study programme by offering micro-qualifications for applied skills in mechatronics- and robotics-oriented courses. It would be worthwhile to introduce a cross-subject semester assignment that requires knowledge of all the subjects. The problems should require a solution employing not subject-based areas of knowledge, but rather a comprehensive understanding of the interconnection between the areas of knowledge.

Quality grade: Fulfilled

2.3. The intended course outcomes are aligned with the intended learning outcomes at the level of the study programme.

Analysis:

For each course, the HEI has provided a description of the course objectives, the ILOs and the detailed course content. In Table 2 in the document *Application form*, intended learning outcomes from the three main categories, Fundamental knowledge (3 intended learning outcomes), Specialist competencies (3 intended learning outcomes) and Applied skills (3 intended learning outcomes) are covered in several courses, ranging from 8 to 31. This indicates that the intended course outcomes include the development of generic and profession-specific competencies. The proposed study programme includes individual courses, micro-qualifications modules, internships, student practice, and



student projects. Thus, all elements that students will need to master upon successful completion of work are covered and present in each study element. Table 2 clearly demonstrates the alignment of the intended learning outcomes of each course with the programme level outcomes.

During the discussion with stakeholders from the industry, a strong support was expressed for the proposed learning outcomes of the study programme.

The analysis of the content and learning outcomes of a total of 23 compulsory and 39 elective courses showed that the HEI has taken care to minimize the overlap of learning outcomes.

Recommendations: It was noted that the style of presentation of the intended learning outcomes for the courses is not consistent (numbered lists, normal text). Some courses have a very detailed description of the content, others do not. It is recommended that additional efforts are made to make the descriptions more consistent.

Quality grade: Fulfilled

2.4. The study programme content allows students to achieve all the intended learning outcomes.

Analysis:

As mentioned above, the study programme contains three main ILO categories, namely Fundamental knowledge (3 ILOs), Specialist competencies (3 ILOs) and Applied skills (3 ILOs), all of which are well covered by the learning outcomes of a range of compulsory and elective courses. They range from generic to profession-specific skills and knowledge. By being comparable with the existing study programmes in the Republic of Croatia and EU countries, the study programme creates the necessary conditions for horizontal and vertical mobility of students in the national and European educational area. During the discussion, some mobility examples were provided.

The information contained in the document *Application form* demonstrates that the institution has taken care to formulate the contents of the courses in such a way that they are consistent with the intended study outcomes and that each intended learning outcome is presented in at least one mandatory course.

In creating a programme's curriculum, the HEI has taken care to identify the best fit of courses for a specific semester/year of study to ensure the logical sequence of their



delivery as well as continuous and timely acquisition of specific competencies required for forthcoming academic commitments. The timing of courses has also been designed to ensure that all core disciplines are well represented and that all professional skills can be acquired during the duration of studies.

Recommendations:

There are two courses, *Machine Elements 1* and *Machine Elements 2*, which the student can take in reverse order. In direct conversation, the programme director and the lecturers communicated to the Panel members at the meeting that these two courses are self-contained and can be taken in any order. The recommendation of the Panel members is to change the names of the courses to avoid the numbers 1 and 2 that could be misleading.

Quality grade: Fulfilled

2.5. ECTS distribution is aligned with the anticipated actual student workload.

Analysis:

The proposed three-year Bachelor's degree study programme comprises courses spread over six semesters, each equivalent to 30 ECTS credits. The analysis of the course descriptions in the document *Application form* has resulted in the conclusion that the number of ECTS credits allocated to each course was correctly assessed in accordance with the rules and recommendations applicable in the European Higher Education Area (ECTS User's Guide) and with common practice and the experience of the Panel members.

The Faculty took care that ECTS credits are allocated for each element of the study programme based on the actual workload of the students. In order to ensure continuous and long-term control over the distribution of ECTS credits and to underpin consistency in allocation of ECTS credits, the HEI has appointed an ECTS coordinator from representatives of the dean's office, who is responsible for reconciling ECTS credits with the actual workload of students.

Recommendations:

When considering the ECTS distribution with regard to the expected actual workload of the students, the members of the Panel found that the number of ECTS credits for elective courses varies between 4 and 7, while the maximum number of ECTS credits per semester is 11 for winter semesters and 9 for summer semesters. The Panel members believe that 39 electives are too large a number for a population of only 30+10 students; this could be exacerbated when the drop-out rate of students is taken into account.



Furthermore, due to the set ECTS limits (9 and 11), certain combinations of electives, exceeding these limits (e.g., 6+6 or 6+7), most likely would not be taken by students in the same way as those just achieving these limits. The same applies to combinations of courses, for which summary ECTS credits do not reach the limits.

Prior to the meeting with the Faculty staff, the Panel members felt that some courses did not quite fit into the study programme in *Mechatronics and Robotics* (e.g., *Thermodynamics*, *Energy Systems*), but industry representatives and the programme director emphasized the importance of micro-qualifications that require knowledge of these courses. So, the Panel members suggest adapting the content of such courses so that the number of ECTS credits remains in the range of 4-6.

Quality grade: Fulfilled

2.6. Student/professional practice is an integral part of the study programme (if applicable).

Analysis:

The information contained in the document *Application form* and the discussions held with the Faculty staff and industry stakeholders have shown that student/professional practice is taken very seriously as an integral part of the proposed undergraduate degree study programme. This aspect of the degree is strongly supported by representatives from local businesses, development agencies and secondary schools. The Faculty has taken steps to introduce students to local companies that offer them internships and professional practices. In this regard, professional practice is also a compulsory course (5 ECTS) included in the 6th semester of the proposed study programme. The Economic Council of the Faculty of Engineering controls the quality of the implementation of professional practice.

Recommendations:

The Panel members recommended that the Faculty and industry representatives seek to involve industry-based co-mentors for undergraduate theses and student projects and encourage the awarding of scholarships for interested students.

Quality grade: Fulfilled



2.7. If the completion of the study programme allows students access to a regulated profession, the programme is aligned with national and European regulations and the recommendations of national and international professional associations.

Analysis:

The strong support that local businesses, development agencies and secondary schools give to the study programme is a promise for the future successful development of the programme. Although this new profession is not listed in the CQF, the programme is based on already implemented programmes with a similar profile that take into account national and European regulations and the recommendations of national and international professional associations. One of the strongest arguments for this is the very low number of unemployed engineers from technical fields included in the multidisciplinary University undergraduate study programme in Mechatronics and Robotics.

Recommendations: None

Quality grade: n/a



III. Teaching process and student support

3.1. Admission requirements and criteria as well as the admissions procedure are clearly defined and transparent, and guarantee that students will possess the necessary prior knowledge.

Analysis:

The Faculty of Engineering at the University of Rijeka conducts enrolment through a public competition, ensuring transparency and equal opportunities. Enrolment for undergraduate studies is done via the NISpVU system, with detailed information available on the official website. The scoring system for various programmes includes high school performance, state graduation exam results, and optional subject scores. Direct enrolment is granted to top performers in national competitions. A transfer to subsequent years is possible, with recognition of prior learning assessed by a dedicated commission.

The Panel found clear and unambiguous admission criteria (high school performance, State Matura exam, elective exams, additional assessment of knowledge and skills). The decision-making process based on the admission criteria is defined and publicly available.

Recommendations:

Disclosure of all admission information related to the study programme is recommended in both Croatian and English languages.

Quality grade: Fulfilled

3.2. The planned teaching methods guarantee student-centred teaching and the achievement of all intended learning outcomes.

Analysis:

The Faculty of Engineering at the University of Rijeka implements various teaching methods to promote creative and critical thinking among students. Various teaching methods are planned, including lectures, seminars, and e-learning systems (LMS, VLS), helping achieve all intended learning outcomes and promoting creative and critical thinking. Practical training in laboratories, visits to companies and implementation of individual and team projects are aimed at the development of problem-solving and practical skills.



The plans foresee the practical training, continuous education for staff, and access to e-learning platforms (Moodle and Coursera). The Faculty emphasizes practical final theses in collaboration with industrial partners in order to meet real market needs, ensuring a rich learning experience for students.

The student workload is distributed evenly throughout the semester, considering the number of ECTS points assigned to each course, and student achievements are carefully monitored and evaluated. The planned system monitoring the quality of instructional delivery and use of teaching methods (surveys, questionnaires, talks with stakeholders, etc.) is adequate.

The teaching methods are adapted to diverse student populations and the help and special support for students of special categories is provided, as defined by the Regulations on Studies and Studying of the University of Rijeka of the University of Rijeka, Article 19.

The Panel mentions the variety of student projects presented during the visit, the professional quality of their preparation and the availability of equipment as particularly interesting.

Recommendations:

The Panel recommends including topics related to industrial and social robots with respective laboratory facilities (e.g., industrial robot, social robot platform) developed.

Quality grade: Fulfilled

3.3. The higher education institution has provided evidence that adequate support will be ensured for future students.

Analysis:

The regulations governing studies at the University of Rijeka, including study programmes, organization, and student rights, are detailed in the Regulation on Studies and Studying. The Faculty of Engineering operates according to its Statute and provides resources such as libraries and laboratories for students.

Support services include study records, supervision provisions, and counselling at the university level, with access to a student ombudsman. Students can also contact teachers through email and the Merlin e-learning system for assistance outside of office hours.



The Faculty of Engineering employs an appropriate number of qualified staff to secure the execution of all administrative and teaching processes. The number, qualification structure, and availability of library and administrative staff are adequate.

The Panel found the established student support and counselling services (psychological, academic/study, legal, career guidance) at the level of university or its structural elements.

Recommendations:

None

Quality grade: Fulfilled

3.4. Objective and consistent evaluation and assessment of student achievements are planned so as to ensure the achievement of all intended learning outcomes.

Analysis:

At the Faculty of Engineering, each study programme has a curriculum outlining the ECTS credits, objectives, learning outcomes, teaching methods, assessment criteria, and recommended literature. The curriculum for each study programme includes specific details. Detailed course implementation plans are published in advance. The study programme proposal is appropriate; the prerequisites sometimes serve to avoid the student's overload.

Assessment and evaluation methods for each subject of the University undergraduate study programme in Mechatronics and Robotics are aligned with the education objectives, which will be publicly available on the Faculty's website. Not every subject has a defined procedure to ensure objectivity and consistent implementation, but with the observation of general rules, this can be provided. The procedure for activities to support skills development related to testing and examination methods for the staff who evaluate the students are partially developed.

Special provisions are made for students with disabilities, including adapted assessment methods and study conditions to ensure equitable learning opportunities tailored to their individual needs and challenges. Such adjustments, determined by the University of Rijeka's Counselling Centre for Students with Disabilities, aim to effectively support students in achieving their educational goals. Detailed course implementation plans are available on the Faculty's website. Procedures on modification of examination processes for students with partial learning disabilities are defined by the University.



Students have the right to complain about the assessment and evaluation in exams, with the complaint procedure defined in the *Regulation on Studies and Studying* of the University of Rijeka and available to the students.

Recommendations:

The study programme is very subject-oriented. When developing subject topics, it would be better to take into account, and explain, the interrelationships between the subjects in the programme.

Quality grade: Fulfilled



IV. Teaching resources and infrastructure

4.1. The higher education institution has ensured adequate teaching capacities to deliver the study programme and achieve the intended learning outcomes.

Analysis:

According to the document *Application form* of the HEI, at the time of application submission, full-time teachers at the Faculty of Engineering deliver over 50% of direct instruction, with 190 full-time and 3 part-time employees. This number is fully adequate; it includes 79 employees in scientific-teaching positions (27 full professors with tenure, 16 full professors, 27 associate professors, and 9 assistant professors), 8 in teaching positions, and 57 in associate positions. A total of 101 teachers and associates hold PhD degrees. The Faculty also collaborates with 23 external associates from other higher education institutions and industry. Given the current student population at the Faculty of Engineering in Rijeka, the projected number of students in the new programme, and the existing number of teachers, the teacher-student ratio will be approximately 1:10, well below the required 30:1 level.

According to Tables 4 and 5 from the document *Application form* of the HEI, it is apparent that the total annual teaching load of all teachers does not exceed 20% of the total annual standard teaching load.

The teachers included in the implementation of the new study programme are qualified to deliver the courses in it since they already deliver similar courses in the existing study programmes at the same Faculty.

The Faculty clearly indicated their support for scientific, teaching and professional development of the university teachers through participation in scientific and professional conferences and various mobility programs (e.g. Erasmus, Fulbright, etc.).

Recommendations:

The introduction of the new study programme may potentially lead to a significant increase in teaching workload for some teachers. While currently an individual teacher's annual teaching load doesn't exceed 20% of the total standard teaching load, the new programme could potentially push one teacher's load beyond this level. Therefore, we recommend developing a plan to expand the teaching capacity for specific courses.

Quality grade: Fulfilled



4.2. The qualifications and professional experience of external associates are appropriate for the delivery of the study programme and the achievement of the intended learning outcomes.

Analysis:

Two external collaborators are planned to be engaged in the University undergraduate study programme in Mechatronics and Robotics. Both collaborators have a prior teaching experience at different universities and currently work at the Faculty of Maritime Studies and University North. Department of Human Resources of the Faculty of Engineering holds permits for collaboration with their parent institutions.

According to the document *Application form* of the HEI, the Faculty of Engineering in Rijeka already maintains partnerships with 23 external collaborators from both higher education institutions and industry. These collaborators enrich the study programmes with their valuable work experience and are chosen for their expertise in particular fields. Ensuring alignment with current research, trends, and industry standards is a priority for the Faculty. From the meeting with the stakeholders, it was evident that the Faculty strongly supports student practice and participation of external associates in student supervision.

Recommendations:

The Faculty should directly encourage the participation of external associates in the supervision of final and graduation theses and organization of student/professional practice.

Quality grade: Fulfilled

4.3. The premises, equipment and entire infrastructure (classrooms, laboratories, library, etc.) are appropriate for the delivery of the study programme and ensure the achievement of the intended learning outcomes.

Analysis:

According to the Faculty *Application form*, the Faculty of Engineering at the University of Rijeka offers ample space, providing over 3 m² per student. It has a gross floor area of 11,922 m², with 8,062 m² in the main building and 3,860 m² in the laboratory building. The usable areas include 1,338.25 m² for lecture halls and classrooms, 538.45 m² for computer labs, 1,800 m² for faculty offices, 750 m² for the laboratory hall housing scientific laboratories, and 2,098.7 m² for teaching laboratories.



With this space and equipment, lectures and practical exercises for the projected number of students can be effectively organized to achieve the planned ILOs and implementation of research. During the study programme delivery tour, the facilities, equipment, and infrastructure were found to be suitable. The Faculty ensures a computer-to-student ratio of 1:7 and offers wireless internet access throughout student-designated areas.

Recommendations: Even though the equipment was found suitable for the proposed study programme, it is recommended to include some industrial robots for teaching robotic courses, with the funds allocated for the procurement of new equipment potentially used for this purpose.

Quality grade: Fulfilled

4.4. The library premises and resources, as well as access to additional services ensure the availability of literature and library services for the delivery of the study programme.

Analysis:

The Library of the Faculty of Engineering at the University of Rijeka supports the scientific, research, and educational activities of the Faculty. It occupies 403 m² on two floors, housing reading rooms, a computer room, and library collections available to the staff and students. The reading room provides 33 seats with laptop access and network connections. The computer room has 24 seats with eleven computers for research and study, granting access to electronic databases and library catalogues.

The library collection is tailored to the Faculty's programmes, focusing on technical sciences, electrical engineering, shipbuilding, computer science, and mechanical engineering. It continually updates and modernizes its collection, comprising over 22,000 bound publications, 750 periodical titles, and about 1,700 non-book materials as of 2023.

Library services include lending, interlibrary loans, user education, and support for the scientific-teaching process, facilitated through the University of Rijeka library system. According to the University's self-assessment, it meets the conditions stated in the *Standard for higher education, university and scientific libraries* (Official Gazette 81/22).

Recommendations: None

Quality grade: Fulfilled



4.5. The higher education institution ensures the availability of the necessary financial resources to organise the activities and provide a high quality of delivery of the proposed study programme.

Analysis:

Table 8 and publicly accessible financial records clearly demonstrate financial stability of the Faculty of Engineering at the University of Rijeka. Additionally, it anticipates receiving extra funds of EUR 18,722.75 annually per student from the Ministry of Science and Education under the category "Funding of educational activities," based on student enrolment. Moreover, it expects to generate revenues of EUR 9,781.70 per student annually from tuition fees for part-time students based on the University of Rijeka's decision on tuition-fee level for the academic year 2023/2024, categorized as "Dedicated tuition fee revenues.". The bulk of projected costs encompass fees for external associates, computers, and energy consumption.

The revenue streams, along with projected costs, are deemed sufficient to cover the expenses of the proposed study programme especially since most of the courses are already given in the delivered study programmes and the existing infrastructure is used.

Recommendations: None

Quality grade: Fulfilled



☐ **AMEND THE STUDY PROGRAMME**

Rationale:

OPINION OF THE EXPERT PANEL AFTER PROGRAMME AMENDMENTS

FINAL RECOMMENDATION OF THE EXPERT PANEL MEMBERS:

a. ☒ **ISSUE A LICENSE, rationale:**

The Panel thoroughly analysed all the submitted documents, with the main emphasis on “Initial accreditation procedure application form - study programme / University undergraduate study programme in Mechatronics and Robotics / University of Rijeka, Faculty of Engineering” and “Curriculum / University undergraduate study programme in Mechatronics and Robotics”. The main document contains a detailed and systematic self-evaluation, covering most aspects related to the Quality Standards for Evaluation together with a considerable amount of supporting information and data. The meetings by the Panel with the Faculty Management, the head of the study programme, teachers involved in delivery of the programme, external stakeholders as well as tours and visits to facilities, demonstrated a high level of readiness of the Faculty of Engineering, University of Rijeka, to the launch of the study programme in Mechatronics and Robotics. A strong local support by representatives of industrial companies and other local institutions additionally underpins the efforts of the Faculty, laying strong foundation for successful implementation of the submitted plans.

All the quality grades of the submitted programme – both for the assessment areas and standards – are fulfilled.

b. ☐ **DENY THE REQUEST FOR ISSUING A LICENSE, rationale:**



ANNEXES

1. Quality grade summary - tables

<i>Quality grade by assessment area</i>			
<i>Assessment area</i>	Not fulfilled	Partially fulfilled	Fulfilled
<i>I. Internal Quality Assurance</i>			X
<i>II. Study programme</i>			X
<i>III. Teaching process and student support</i>			X
<i>IV. Teaching resources and infrastructure</i>			X



<i>Quality grade by standard</i>			
<i>I. Internal Quality Assurance</i>	Not fulfilled	Partially fulfilled	Fulfilled
1.1. Clear justification for the introduction of the new study programme has been provided with regard to the mission and strategic goals of the higher education institution, as well as economic and societal needs.			X
1.2. The study programme has undergone an appropriate internal quality assurance process and has been formally approved by the higher education institution.			X
1.3. The higher education institution will collect, analyse and use relevant data for the effective management and continuous enhancement of the study programme in accordance with the published quality assurance policy.			X
1.4. The higher education institution informs the public about the study programmes it offers, as well as plans to launch new programmes, i.e. changes made to existing ones.			X



<i>Quality grade by standard</i>			
<i>II. Study programme</i>	Not fulfilled	Partially fulfilled	Fulfilled
2.1. The proposed study programme is compatible with the qualification standard in the Croatian Qualifications Framework Register.	n/a		
2.2. The intended learning outcomes at the level of the study programme are aligned with the competences a student should gain by completing the study programme, as well as with the CroQF and EQF level.			X
2.3. The intended course outcomes are aligned with the intended learning outcomes at the level of the study programme.			X
2.4. The study programme content allows students to achieve all the intended learning outcomes.			X
2.5. ECTS distribution is aligned with the anticipated actual student workload.			X
2.6. Student/professional practice is an integral part of the study programme (if applicable).			X
2.7. If the completion of the study programme allows students access to a regulated profession, the programme is aligned with national and European regulations and the recommendations of national and international professional associations.	n/a		



<i>Quality grade by standard</i>			
<i>III. Teaching process and student support</i>	Not fulfilled	Partially fulfilled	Fulfilled
3.1. Admission requirements and criteria as well as the admissions procedure are clearly defined and transparent, and guarantee that students will possess the necessary prior knowledge.			X
3.2. The planned teaching methods guarantee student-centred teaching and the achievement of all intended learning outcomes.			X
3.3. The higher education institution has provided evidence that adequate support will be ensured for future students.			X
3.4. Objective and consistent evaluation and assessment of student achievements are planned so as to ensure the achievement of all intended learning outcomes.			X



<i>Quality grade by standard</i>			
<i>IV. Teaching resources and infrastructure</i>	Not fulfilled	Partially fulfilled	Fulfilled
4.1. The higher education institution has ensured adequate teaching capacities to deliver the study programme and achieve the intended learning outcomes.			X
4.2. The qualifications and professional experience of external associates are appropriate for the delivery of the study programme and the achievement of the intended learning outcomes.			X
4.3. The premises, equipment and entire infrastructure (classrooms, laboratories, library, etc.) are appropriate for the delivery of the study programme and ensure the achievement of the intended learning outcomes.			X
4.4. The library premises and resources, as well as access to additional services ensure the availability of literature and library services for the delivery of the study programme.			X
4.5. The higher education institution ensures the availability of the necessary financial resources to organise the activities and provide a high quality of delivery of the proposed study programme.			X



2. Site-visit Protocol

PROTOKOL POSJETA / SITE VISIT PROTOCOL

Mjesto izvođenja studija: Rijeka / Place of study programme delivery: Rijeka

Adresa/Address: Vukovarska 58, 51000, Rijeka

	Utorak 7. svibnja 2024.	Tuesday, 7 th May 2024
09:00 – 09:30	Sastanak s Upravom (<i>bez prezentacije</i>)	Meeting with the Management (<i>no presentation</i>)
09:40 – 10:40	Sastanak s voditeljem studijskog programa	Meeting with the head of the of the study programme
10:40 – 11:00	<i>Pauza i interni sastanak članova Stručnog povjerenstva</i>	<i>Break and internal meeting of the panel members</i>
11:00 – 12:00	Sastanak s nastavnicima koji će biti angažirani na studijskom programu (<i>u stalnom radnom odnosu - nisu na rukovodećim mjestima i vanjskim nastavnicima</i>)	Meeting with teachers (<i>full time employed - except those in managerial positions and external teachers</i>)
12:00 – 13:15	Obilazak mjesta izvođenja studija (<i>knjižnica, nastavni laboratoriji/praktikumi/in formatička učionica, ured za studente, predavaonice</i>)	Tour of the place of study programme delivery (<i>library, teaching laboratories/practicums, Computer classrooms, Office for students, classrooms</i>)
13:15 – 14:45	<i>Radni ručak Stručnog povjerenstva</i>	<i>Working lunch</i>
14:45 – 15:45	Sastanak s vanjskim dionicima - predstavnicima strukovnih i profesionalnih udruženja, poslovna zajednica, poslodavci, stručnjaci iz prakse, organizacijama civilnog društva.	Meeting with external stakeholders -representatives of professional organisations, business sector/industry sector, professional experts, non-governmental organisations, external lecturers



15:45 - 16:15	Organizacija dodatnog sastanka o otvorenim pitanjima, prema potrebi	Organisation of additional meeting on open questions, if needed
16:15 - 16:45	Interni sastanak članova stručnog povjerenstva – priprema za završni sastanak	Internal meeting of the panel members – preparation for the exit meeting
16:45- 17:00	Završni sastanak s Upravom	Exit meeting with the Management