



**REPORT
OF THE EXPERT PANEL
ON THE
RE-ACCREDITATION OF
Faculty of Chemical Engineering and Technology University
of Zagreb**

**Date of preliminary site visit:
7 March 2022.**

**Date of on-line re-accreditation:
9 – 11 March 2022.**

March 2022

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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 European Association for Quality Assurance in Higher Education (ENQA).

All public and private higher education institutions are subject to re-accreditation, which is conducted in five-year cycles by the Agency, in accordance with the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09) and subordinate regulations, and by following *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) and good international practice in quality assurance of higher education and science.

The Agency's Accreditation Council appointed an independent Expert Panel for the evaluation of Faculty of Chemical Engineering and Technology University of Zagreb.

Members of the Expert Panel:

- Prof. Andrew Mullis, School of Chemical and Process Engineering, University of Leeds, United Kingdom of Great Britain and Northern Ireland, Panel chair,
- Assoc. prof. Kerstin Forsberg, KTH Royal Institute of Technology in Stockholm, Kingdom of Sweden,
- Prof. Gianluca Li Puma, Loughborough University, United Kingdom of Great Britain and Northern Ireland,
- Asst. prof. dr. sc. Viljemka Bučević Popović, University of Split Faculty of Science, Republic of Croatia,
- Prof. dr. sc. Dražan Jozić, University of Split Faculty of Chemistry and Technology, Republic of Croatia,
- Ana Plasajec, Department of Chemistry, J. J. Strossmayer University of Osijek, Republic of Croatia, student.

During the on-line re-accreditation, the Expert Panel held meetings with the following stakeholders:

- Management,
- Quality Management Commission,
- Vice Dean for Education,
- Heads of departments,
- Full-time teaching staff,

- ECTS Coordinator,
- Commissioner for Professional Practice,
- Representatives of Advisory and Students' Career Development Centre,
- Head of Office for International Cooperation,
- Head of the Ethics Committee,
- Head of library,
- Coordinator for students with disabilities,
- Students,
- Alumni,
- External stakeholders,
- Vice Dean for Science,
- Heads of research projects,
- Teaching Assistants and postdoctoral researchers.

Croatian Expert Panel members went to the preliminary site-visit on 7 March 2022 during which they had a tour of the work facilities, laboratories, library, IT classrooms, student administration office and classrooms, and attended sample lectures, where they held a brief Q&A session with students.

During the preliminary site visit, the Expert Panel examined the available additional documents and study programme descriptions (learning outcomes).

The Expert Panel drafted this Report on the re-accreditation of Faculty of Chemical Engineering and Technology University of Zagreb on the basis of Faculty of Chemical Engineering and Technology University of Zagreb self-evaluation report, other relevant documents, preliminary site visit and on-line meetings.

The Report contains the following elements:

- Short description of the evaluated higher education institution,
- Brief analysis of the institutional advantages and disadvantages,
- List of institutional good practices,
- Analysis of each assessment area, recommendations for improvement and quality grade for each assessment area,
- Detailed analysis of each standard, recommendations for improvement and quality grade for each standard,
- Appendices (quality assessment summary by each assessment area and standard, and protocol),
- Summary.

In the analysis of the documentation, preliminary site visit to the Faculty of Chemical Engineering and Technology University of Zagreb, online meetings and writing of the Report, the Expert Panel was supported by:

- Matan Čulo, coordinator, ASHE,
- Igor Opić, interpreter at the preliminary site visit and during the online meetings,
- Ivana Rončević, translator of the Report, ASHE.

On the basis of the re-accreditation procedure conducted, and with the prior opinion of the Accreditation Council, the Agency issues a following accreditation recommendation to the Minister for Higher Education and Science:

1. **issuance of a confirmation on compliance with the requirements** for performing the activities, or parts of the activities
2. **denial of license** for performing the activities, or parts of the activities
3. **issuance of a letter of expectation** with the deadline for resolving deficiencies of up to three years. A letter of expectation can include the suspension of student enrolment within a set period.

The accreditation recommendation also includes a quality grade of a higher education institution, and recommendations for quality improvement.

SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION

NAME OF HIGHER EDUCATION INSTITUTION:

Faculty of Chemical Engineering and Technology, University of Zagreb

ADDRESS:

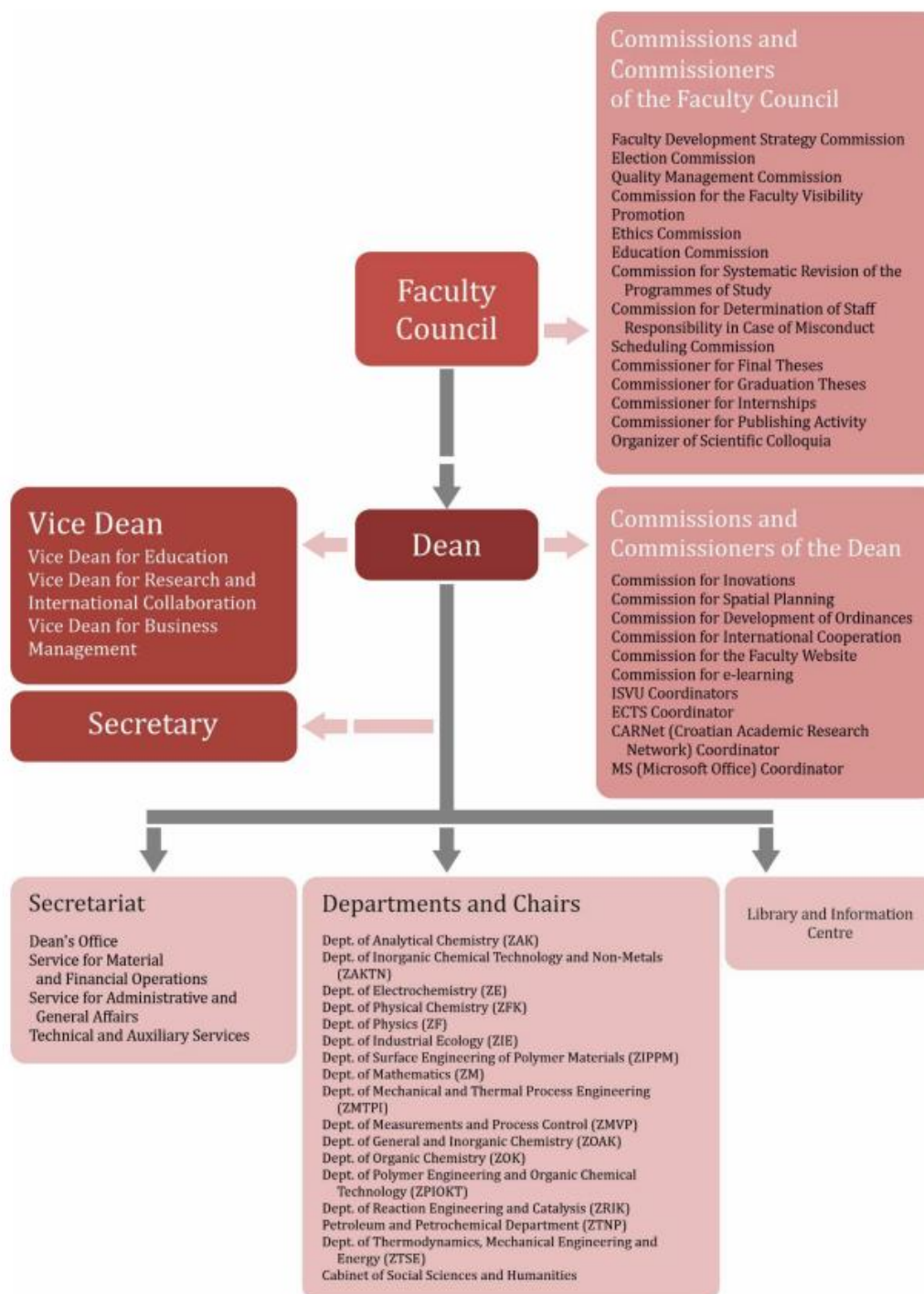
Trg Marka Marulića 19

DEAN:

Prof. Ante Jukić, Ph.D

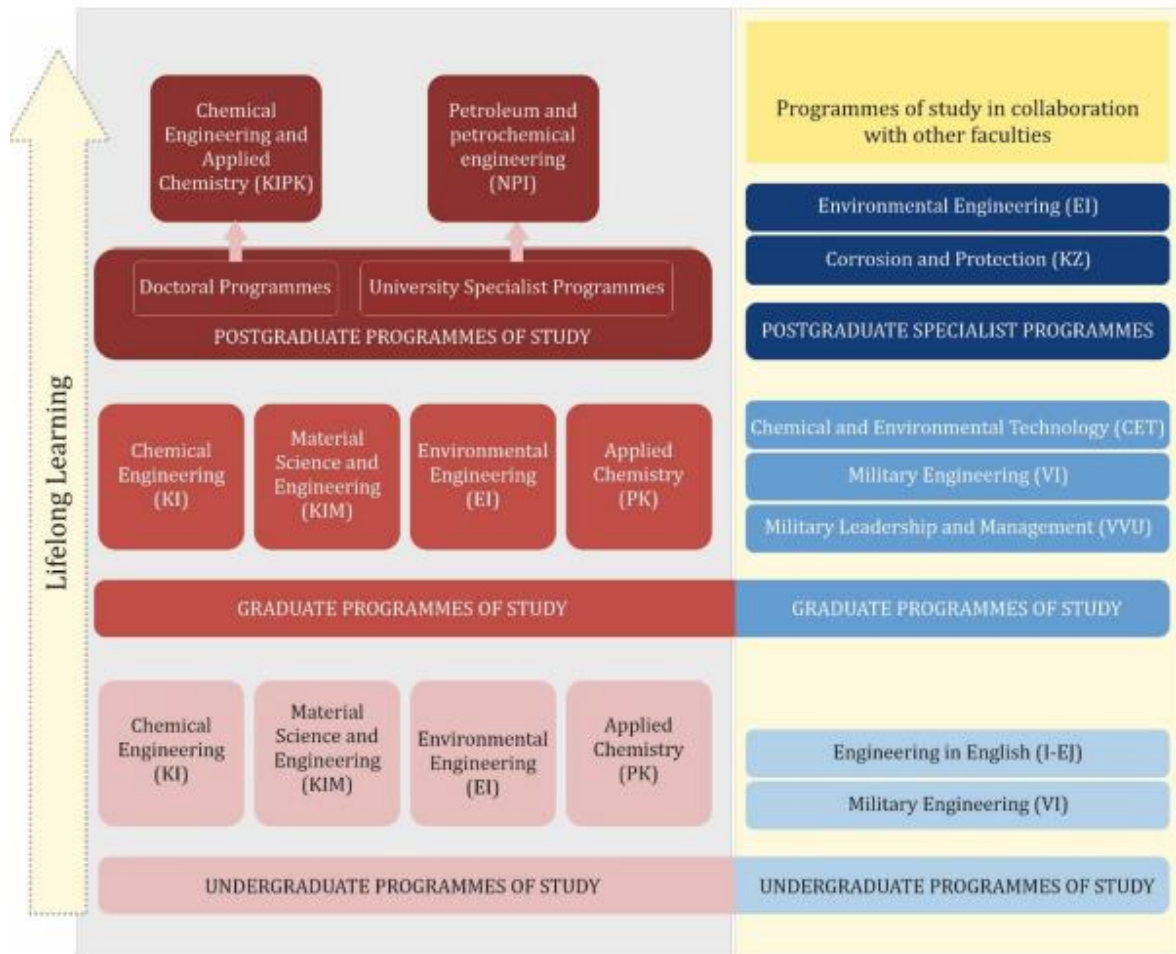
ORGANISATIONAL STRUCTURE:

*According to the Self-evaluation report page 3



STUDY PROGRAMMES:

*According to the Self-evaluation report page 27



NUMBER OF STUDENTS:

*According to the Analytic supplement page 2

Tablica 3.1. Broj studenata po studijskom programu za akademsku godinu vrednovanja

Naziv studijskog programa	Redoviti studenti	Izvanredni studenti
Chemical and Environmental Technology (1488), diplomski sveučilišni studij, Zagreb	9	0
Kemijsko inženjerstvo (1710), preddiplomski sveučilišni studij, Zagreb	256	0
Kemijsko inženjerstvo (1711), diplomski sveučilišni studij, Zagreb	86	0
Kemija i inženjerstvo materijala (1712), preddiplomski sveučilišni studij, Zagreb	180	0
Kemija i inženjerstvo materijala (1713), diplomski sveučilišni studij, Zagreb	67	0
Primijenjena kemija; smjerovi: Kemija u zaštiti okoliša i izvori energije, Specifični materijali i napredne tehnologije, Primijenjena organska kemija (1714), preddiplomski sveučilišni studij, Zagreb	180	0
Primijenjena kemija; smjerovi: Kemija u zaštiti okoliša i izvori energije, Specifični materijali i napredne tehnologije, Primijenjena organska kemija (1715), diplomski sveučilišni studij, Zagreb	71	0
Ekoinženjerstvo (1716), preddiplomski sveučilišni studij, Zagreb	168	0
Ekoinženjerstvo (1717), diplomski sveučilišni studij, Zagreb	39	0
Kemijsko inženjerstvo i primijenjena kemija (1719), poslijediplomski sveučilišni (doktorski) studij, Zagreb	124	0
Ukupno	1.180	0

NUMBER OF TEACHERS:

*According to the Analytic supplement page 15

Table 4.1.a Staff Structure - FOR UNIVERSITIES in the evaluated academic year

Staff*	Full-time staff		Cumulative employment		External associates	
	Number	Average age	Number	Average age	Number	Average age
Full professors with tenure	20	59,05	-	-	2	56,5
Full professors	16	49,94	1	0	10	56
Associate professors	16	49,88	-	-	3	49,33
Assistant professors	13	38	-	-	4	47,25
Scientific advisor (permanent/ with tenure)	-	-	-	-	-	-
Scientific advisor	-	-	-	-	2	54
Senior Research Associate	-	-	-	-	-	-
Research Associate	6	39,17	-	-	1	39
Teaching grades	5	50,33	-	-	-	-
Assistants	80	28,6	-	-	-	-
Postdoctoral researcher	13	34,69	-	-	-	-
Employees on projects	1	29	-	-	-	-
Expert assistants	2	49	-	-	-	-
Technical staff	17	45,71	-	-	-	-
Administrative staff	23	54,19	-	-	-	-
Support staff	20	53,5	-	-	-	-

SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION

The Faculty of Chemical Engineering and Technology is a part of University of Zagreb. Although it is an independent legal entity, the activities of the Faculty are harmonized with the Statue of the University, its current Development Strategies and all other legal and normative acts of the University. The Faculty of Chemical Engineering and Technology is a higher education institution that does the following in the scientific field of chemical engineering and the scientific field of chemistry:

- organizes and conducts university undergraduate, graduate, doctoral and specialist studies,
- organizes and performs scientific work related to the educational process through doctoral and specialist studies,
- realizes projects for the economy and in cooperation with the economy,

- organizes colloquia, seminars, symposia and other scientific and professional conferences,
- publishes scientific and professional papers, books, monographs, textbooks, scripts, bulletins, etc.,
- popularizes scientific and professional results,
- cooperates with scientific, professional, educational and other organizations in the fields of its own and related activities.

BRIEF ANALYSIS OF THE INSTITUTIONAL ADVANTAGES AND DISADVANTAGES

ADVANTAGES OF THE INSTITUTION

1. The HEI gives students a sound grounding in fundamental knowledge related to the discipline.
2. The HEI possesses well-equipped laboratories with state-of-the-art analytical facilities.
3. Graduates of the HEI are highly employable with many of its alumni occupy senior positions within industry, other HEI's or professional bodies related to the discipline.
4. The HEI participates in a good range of scientific research projects, many of which are in collaboration with Croatian industrial partners.
5. The HEI demonstrates sound financial planning which has permitted investment, including repairs to buildings.

DISADVANTAGES OF THE INSTITUTION

1. There are some weaknesses in communication with students across a range of issues including examination timetabling, advertising of project opportunities, mobility programmes, etc. This is also reflected in the Faculty website, many of the pages for which are not up-to-date.
2. The HEI's Research Strategy document expired in 2020 and, as at the date of the site-visit, an updated version had not been produced.
3. Much of the Institutions space is in buildings that are old, too small or unfit for purpose and in some cases have suffered from extensive earthquake damage. However, the accreditation panel acknowledges there is a long-term plan to move to a new campus to rectify the current space issues.

4. Students with disabilities (including unseen disabilities) are very significantly underrepresented in the student body of the HEI.
5. Some staff and teaching assistants within the HEI have very high workloads, in some cases in excess of the maximum established under the provisions of the Collective Agreement.

LIST OF INSTITUTIONAL GOOD PRACTICES

EXAMPLES OF GOOD PRACTICE

1. Robust and transparent admissions criteria are set by the HEI which are fairly and consistently applied.
2. Regular feedback is sought from students on the performance of the Faculty and its staff. Students are represented on many of the Faculty's boards and committees (including Faculty Council) ensuring good student representation in management decisions.
3. The HEI exercises robust recruitment and promotion procedures with quantitative standards that are in excess of the national minimum, ensuring a high-quality staff profile.
4. All programmes of study offered by the HEI have clearly articulated learning outcomes and the programme content, teaching and assessment methods are closely aligned so as to ensure delivery of the learning outcomes.
5. There is a strong research culture within the HEI, with many of its academic staff being recognised nationally and internationally for the quality of their research outputs.

ANALYSIS OF EACH ASSESSMENT AREA, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE FOR EACH ASSESSMENT AREA

I. Internal quality assurance and the social role of the higher education institution

Analysis

The internal quality assurance of the Faculty is detailed in the self-analysis document and was discussed during the virtual site-visits. The quality assurance system involves all relevant activities and stakeholders. Different methods are used to collect input from the various stakeholders such as student surveys, external stakeholders' satisfactory surveys and councils. The possibility to give formal feedback was appreciated by the student body. However, during the site visits there were some indications of low response rate for some of the surveys.

From the visits it was clear that the faculty has a vision and strategic agenda both in a short and long-time perspective, however a formal document detailing this strategic program is not yet in place. It is evident that several improvements have been implemented since the reaccreditation in 2015, e.g., connected to internationalization, improvement of facilities and of the doctoral study programme, and additional efforts are in progress. The faculty follows the university's code of ethics and has established an ethics commission accordingly. During the virtual site visits there were indications that the awareness of the ethics commission was sometimes lacking.

The faculty maintains web pages in Croatian and in English that provide basic information. All information relevant to students may be found in the Student's Guide. There is also a webpage section providing information on ongoing scientific projects. However, there is significant room for improvement regarding the presentation of scientific activities. The social role of the faculty is exemplified by several different activities that contribute to economic and social development. In addition to activities reported in the self-evaluation document, the co-operation between the faculty and the economy was also confirmed during the meeting with external stakeholders.

The Faculty delivers different forms of lifelong learning programmes and has adopted the Lifelong Education Ordinance in 2018. These programmes are mainly without ECTS credits. The improvement of lifelong education programmes has been included in the Development Strategy (2021-2031).

Recommendations for improvement

1. The Faculty must establish a formal document describing the strategic research agenda.

2. The Faculty is encouraged to record the response rate to surveys as well as the results.
3. The Faculty should establish clearly defined and measurable goals for internationalization.
4. The Faculty should consider establishing a mandatory course in ethics for students.
5. The Faculty must raise awareness for the provision for students with disabilities.
6. We encourage the management to undertake the planned improvements to the webpages, in particular regarding the presentation of research activities.

Quality grade

Satisfactory level of quality

II. Study programmes

Analysis

The profile of the study programs offered by the Faculty are well aligned with the objectives defined in the current (2014-2025) University of Zagreb Study Strategy document. The study programmes are linked to research activities at the University and to industry. From the site visits it became clear that the Faculty's graduates are highly employable and their skills are appreciated by the external stakeholders. The faculty analyses its educational capacity via an annual self-analysis.

The learning outcomes are aligned with the different study level ordinances at the university and the Faculty's vision as detailed in the 10-year development strategy (2021-2031). The adopted study programs have been revised and aligned with the CroQF standards. The high employability of the graduated students is a clear sign of the achievement of the intended learning outcomes which was also verified during the site visits. There are strict protocols for study program changes. However, there is evidence that many teaching staff keep annual changes to courses below the 20% threshold for detailed review in order to streamline the approval process and, as such, the protocol may actually act as a barrier to more radical re-evaluation of courses.

A revision of the undergraduate and graduate study programmes was initiated in the academic year 2019/ 2020. However, it was then suspended in 2020 due to the pandemic and has not yet been resumed. From the online site visits some room for improvement could be identified concerning education in topics such as circular economy, legislation and in soft skills such as public speaking and leadership. These skills were expressed as valuable by the external stakeholders.

The Faculty has a good understanding of where a mismatch between ECTS credits and student workload exist, both for courses with too high a workload for the credits awarded

and too low a workload for the credits awarded. Moreover, there are currently no ECTS credits given for the compulsory summer internships. There is currently little evidence of these imbalances being addressed, which was planned to form part of the (currently suspended) wider curriculum review. This should be addressed as a priority.

Student practice is implemented in the study programmes via an Internship scheme, comprising a 160-hour summer placement. This is a compulsory part of the undergraduate programmes, however no ECTS credits are awarded. Internships are also integrated in all graduate study programmes. Reasonable mechanisms appear to be in place to ensure that internship hosts offer an appropriate student experience with the correct balance of skills development and learning opportunities. Students felt that they were offered good support in finding internships based in and around Zagreb, but that support was much more variable for students wishing to take up internships closer to their home towns.

Recommendations for improvement

1. The strategic revision of the undergraduate and graduate study programmes, halted in 2020 due to the global pandemic, should be reinstated as a matter of urgency.
2. Where an imbalance between student workload and ECTS credits awarded has been identified, such imbalance should be rectified.
3. Student practice via internships should be assigned ECTS credits and, as part of this, the Faculty should look at ways in which the internship period could be moved within the core teaching semester.
4. The Faculty should look at ways in which it can offer better support to students wishing to be based outside of Zagreb for their internship.
5. Identify key future developments in petroleum and petrochemical engineering and develop the postgraduate program accordingly to increase the attractiveness of this programme, so that it supports industrial transformation in this sector.

Quality grade

Satisfactory level of quality

III. Teaching process and student support

Analysis

The Faculty publishes clearly defined admission procedures, decisions on enrolment criteria and criteria for the continuation of studies, with these being applied consistently across all programmes of study. The higher education institution analyses data on student

pass rates and strives to increase student pass rates by introducing appropriate measures. As an example of one such measure, in the academic year 2019/2020 chemistry was introduced as a compulsory high school graduation exam. A wide range of teaching methods are utilised, including traditional lecture classes, extensive laboratory class, on-line learning and group assignments. Teaching methods employed are adapted to students with the aim of improving interactive and research-based learning, problem solving and creative thinking. Although students receive grades on all submitted assignments and are given the opportunity to discuss performance with teaching staff uptake of such opportunities appears to be low and students should be provided with written feedback on at least a proportion of assignments submitted in each year of study. Exam papers are reviewed within Departments but such review lacks a formal structure. There was also anecdotal evidence of errors being reported in the tallying of marks on exam papers.

There is evidence of a number of workshops being organised to encourage good teaching practice. However, these appear to be organised on an ad hoc basis and a clear strategy for staff development is lacking. Students have opportunities to express their opinion and give suggestions for improvement through surveys and influence the decision-making processes on issues that concern them. Students have opportunities to participate in scientific projects, through final and graduate theses, individually or in groups. General support and guidance to students is available from via a number of sources including the office of the vice-Dean for Education, Heads of Departments, programme co-ordinators, student support office and individual teachers. However, students receiving support for disabilities (including unseen disabilities such as learning disabilities and mental health problems) are very significantly under-represented in the Faculty and the reasons for this need to be addressed.

The higher education institution allows students to gain international experience but there are some concerns regarding limited communication of opportunities and lack of support for organising exchange visits. The higher education institution ensures adequate study conditions for foreign students and significant number of the Faculty's courses are delivered in English, with support to learn the Croatian language available. However, there appears to be no process for collecting feedback from incoming foreign students. The Faculty has strong links with industry with evidence of multiple collaborative projects. The, HEI collects and analyses data on the employability of its graduates. Graduates from the Faculty's programmes of study appear highly employable, with evidence of good employment rates and short lead times between graduation and subsequent employment. Generally, employers felt that students had good technical and laboratory skills and that the Faculty's courses equipped them with a sound theoretical basis which allows them to learn and adapt quickly. However, employers also identified

deficiencies in a number of “soft skill” such as presentation skill, commercial awareness and legal/regulatory frameworks.

Recommendations for improvement

1. The Faculty needs to understand why disabled students are so significantly under-represented in the student body and whether its recruitment processes are discouraging such applicants. It also needs to understand why current students are reluctant to disclose a disability and seek appropriate adjustment.
2. Anonymous surveys should be conducted upon application of students to join the Faculty to ascertain levels of students with disabilities being admitted. The long-term goal for the Faculty should be that the ratio of students with one or more disabilities is commensurate with the levels of disability in the general population.
3. Communication with students needs to be improved across a number of areas including advertising Erasmus+ opportunities.
4. The Faculty should consider mandatory written formative feedback on at least a proportion of assignments in each year or study.
5. It is suggested that a formal process for reviewing all examination papers be put in place and for amendments arising from review being recorded.

Quality grade

Satisfactory grade of quality

IV. Teaching and institutional capacities

Analysis

At 18,73 the staff:student ratio comfortably exceeds the minimum requirement. Despite this the workload of some staff fall outside the expected 300±60 hour norm, and a few exceed the 420 hours cap as established by the provisions of the Collective Agreement. Teachers are appropriately qualified to deliver the programmes of study and appear to be highly motivated to do so. Processes for recruitment and promotion within the Institution were found to be robust and fair, making use of a wide range of objective metrics. The Faculty is commended for setting recruitment standards that exceed the national minimum levels, thus ensuring a high-quality staff profile. There is evidence of a number of workshops and courses being offered on an ad hoc basis to disseminate best practice, however there is little evidence of a coherent staff development strategy. There is evidence of international mobility of teaching staff, but it is noted that this relies on either the good will of colleagues to cover teaching or the financial ability of the Departments to buy in teaching cover.

At 4.301 m², available usable space per student is well above the minimum requirements. Many of the Faculty's laboratories are equipped to a very high standard, and the Faculty is commended for the very significant investment it has made in state-of-the-art equipment. Conversely, IT provision is weak in some areas. Also, the library space is poor, being too small and dark to be conducive to scholarship. However, a reasonable range of electronic resources are available and the library is compliant with regard to the requirement to stock core textbooks at 1 per 5 students enrolled. The library also supports the repository for doctoral thesis, and it was noted that there appears to have been a hiatus recently in the deposition of theses. It was also noted that there was no usage of library IT as a repository for the Faculty's own publications using the "Green" open access route.

The Faculty has sound financial plans and a robust accounting and financial management structure. Between 2016-19 the Faculty reported a small but growing year-by-year surplus. A deficit was reported in 2020, but this is due to planned expenditure, primarily the repair of earthquake damage to buildings, and should be seen against the backdrop of income that is continuing to grow year-on-year.

Recommendations for improvement

1. Workload imbalance should be reviewed at Faculty level and a system put in place to reduce the load on the most heavily loaded staff. It is strongly recommended that the absolute cap of 420 teaching hours per year, in accordance with the provisions of the Collective Agreement, be adhered to.
2. The Faculty needs to initiate a formal strategy for staff development so that staff training can be organised in a more coherent and targeted fashion.
3. The Faculty should review IT provision, particularly with regard to solutions that would allow students to access Faculty resources (either physically or virtually) outside of core hours.
4. The Faculty is encouraged to continue its investments in refurbishing and maintenance of laboratories to replace the worn-out laboratory furniture, fume hoods, etc.
5. The Faculty should ensure a publicly accessible repository of doctoral thesis.

Quality grade

Satisfactory level of quality

V. Scientific/artistic activity

Analysis

The Faculty is currently proceeding with the procurement of new scientific equipment to complement the current equipment inventory. This on-going action will allow the Faculty to have excellent infrastructure and resources to deliver high quality research and teaching. During the last five years relating to the period of reaccreditation from 2016-2021, the Faculty employees have published a total number of 563 articles indexed by WoSCC and Scopus database. The five-year average of all papers published by the full-time academic staff averages at 1.62 per year per full-time teacher. Despite the efforts and encouragement by the Faculty management, the mobility of academic staff and researchers remains low, especially in relation to long term placements. In the last five years, the Faculty received a relatively low number of incoming PhD students, postdocs and foreign teachers.

The Faculty employees actively promote their scientific achievements at national and international conferences. In the last five years, 129 peer-reviewed papers were published at scientific and professional conferences. In the period 2015 – 2021, the academic staff of the faculty have delivered 16 keynote lectures at national conferences and 56 at international conferences. The Faculty has developed an adequate number of contracts, agreements and project activities in collaboration with public sector and economic entities. In addition, the Faculty's employees participate in professional, public and advisory bodies and committees in both private and public sectors. The Faculty has several employees who are highly recognised in the national and international context. Additionally, members of the academic staff have been active in the organisation of numerous conferences that took place both nationally and internationally, as well as in the membership of editorial boards of scientific journals. Undergraduate, graduate and postgraduate students are actively involved in scientific processes alongside their teachers. In the last five years, the Faculty 52 employees published 129 papers with students as co-authors. Also, students of all levels are involved in dissemination activities at scientific conferences.

Recommendations for improvement

1. The Faculty should develop an open and visible research strategy containing research pillars and/or cross cutting research themes that incorporates the current and future research activities of the Faculty. This should be made visible through its website, which should also reflect the scientific effort of its faculty members.
2. The Faculty should continue and foster new collaborations with the private sector and should try to increase the number of projects sponsored by them. It should also develop a Technology Transfer Strategy aiming to increase cooperation with

industry and the number of spin-off companies resulting from its research activities.

3. The Faculty should develop a strategy for further internationalization of its research activities.
4. The Faculty should increase the student accessibility of its research facilities, particularly those facilities dedicated to fundamental research.
5. The Faculty should facilitate the mobility of early career researchers, especially the mobility relating to longer placements (more than 6 month). It should also facilitate the uptake of sabbatical leave or study periods by its academic staff and plan appropriate finances to cover their replacement.

Quality grade

Satisfactory grade of quality

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

I. Internal quality assurance and the social role of the higher education institution

1.1. The higher education institution has established a functional internal quality assurance system.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Faculty's Development strategy (2015-2020) and Faculty's Development Strategy (2021-2031)
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers
- Meeting with students

The internal quality assurance system (QAS) of the faculty is detailed in the self-evaluation report and was discussed during the virtual site-visits. Underlying documentation consisting of The Faculty Quality Assurance Systems Ordinance and The Faculty Quality Assurance Manual were provided (albeit only in Croatian). The Faculty's QAS is co-ordinated by Quality Management Commission composed of seven members including the Faculty secretary and a student representative in addition to academic members (note: there is a discrepancy between the Faculty QAS Ordinance that defines The Quality Management Commission as a five-member body and the current practice that should be resolved). The Faculty Quality Assurance manual is harmonized with the university level quality assurance system. The QAS evaluates all activities of the Faculty and delivers annual action plans and reports that are accessible via the Faculty's webpage. The QAS involves all relevant stakeholders. The Faculty's Development Strategies (2015-2020 and 2021-2031) and The Strategic Programme of Scientific Research (2015-2020) were presented to the Panel. The strategic documents comprise the SWOT analysis. From the visits it was clear that the faculty has a vision and strategic agenda both in a short and long-time perspective, however a formal document detailing this strategic program is not yet in place for the upcoming period. Consequently, it is difficult to fully assess how the quality assurance policy is connected to the strategic research agenda of the Faculty. Various methods are used to collect input from the different stakeholders such as student

surveys, graduate student feedback, survey among Faculty's employees, external stakeholders' satisfactory surveys and councils (Economic Council). The possibility to give formal feedback in a survey was appreciated by the student body, they felt that their voice was heard. However, during the site visits there were some indications of low response rate for some of the surveys. In addition, a possibility to give more detailed free feedback in the survey by an open question was requested. The human resources management policy is also developed in accordance with professional standards. Various voluntary workshops are offered to the faculty technical and administrative staff.

Recommendations for improvement

1. The Faculty must establish a formal document describing the strategic research agenda.
2. The Faculty should record the response rate of surveys as well as the results.
3. The Faculty should further develop the student survey in collaboration with the student council.
4. The strategy for improving scientific impact and assessing the outcome could be developed further.
5. The Faculty should establish courses for professional development with participation being a requirement for advanced professional development for all levels of staff.

Quality grade

Satisfactory level of quality

1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers

The Faculty has analysed and implemented improvements based on recommendations from the reaccreditation in 2015 as specified in the Self-analysis document. The improvements were also discussed in the on-line meetings with the different groups of representatives. It is evident that several improvements have been implemented, e.g.

stronger involvement of external stakeholders from the economic sector, investment into modern laboratory equipment, the establishment of the International Co-operation Office, the increase in staff mobility and participation in EU funded projects. Significant improvements have been made in the area of Internationalisation. A new graduate study programme in English - Chemical and Environmental Technology was initiated and one semester of study is organised for students of higher institution from Lyon based on a bilateral agreement. The Faculty's has also been continuously investing in improvements of its facilities.

Another external evaluation was conducted in 2018 with the purpose of reaccreditation of the doctoral programme in Chemical Engineering and Applied Chemistry, which was awarded a 'high level of quality' grade. Since 2019, the Faculty has been actively working on adjustments in those assessment items that still required improvements.

Recommendations for improvement

1. Establish clearly defined and measurable goals for internationalization.
2. Further improvements in staff mobility are strongly encouraged.

Quality grade

Satisfactory level of quality

1.3. The higher education institution supports academic integrity and freedom, prevents all types of unethical behaviour, intolerance and discrimination.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- The University of Zagreb Code of Ethics
- Site visit and discussions
- Meeting with teachers
- Meeting with students

The Faculty follows the university's Code of Ethics and has established an ethics commission accordingly. The Commission ensures compliance with the university code of ethics and has procedures in place for taking action in case of unethical behaviour, intolerance and discrimination. The University of Zagreb Code of Ethics apply to faculty employees (mandatory), students and non-faculty employees. The commission has representatives from all levels of the higher education institution. From the site visits it is

evident that the faculty supports and preserves academic integrity and freedom. Furthermore, European and global standards in employment processes are followed. The faculty systematically addresses issues of academic dishonesty and has awareness about and access to plagiarism software (PlagScan) as evident from the Self-analysis document and site visits. Protocols are in place for how to handle cases of unethical behaviour. However, during the virtual site visits there were indications that the awareness of the ethics commission was sometimes lacking.

Recommendations for improvement

1. The Faculty should establish a mandatory course in ethics for students.
2. The Faculty should increase awareness regarding the role of the ethics committee, particularly among the student body.
3. The Faculty should raise the awareness about students with disabilities.

Quality grade

Satisfactory level of quality

1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Faculty's webpage
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers

The Faculty maintains web pages in Croatian and English that contain basic information such as organisational structure, staff, study programmes, quality assurance documents, etc. There is a section on the website that provides information about ongoing scientific projects. However, we find that the presentation of the Faculty's scientific activities needs significant improvement. For example, navigation to research topics being worked on by specific departments or staff is not easy.

Information relevant to prospective and current students is publicly available, including admission criteria, quotas and learning outcomes, contacts of student coordinators and representatives, and international mobility opportunities. The faculty also publish the annual Student Guide with detailed information on student support, study plan, exam

dates, etc. There are numerous activities carried out within the Faculty that support its social role (Section 1.5.) that deserve to be better represented on the website. The Faculty informs the public about the results of the previous evaluation on its quality assurance website and publishes the analysis of graduate student employment (updated in 2020). However, dropout rates and pass rates are not available on the website. Management members seem generally aware that the web pages need to be redesigned to make the information more accessible and representative of all faculty activities.

Recommendations for improvement

1. The Faculty is strongly encouraged to undertake the planned improvements to the website, in particular where it relates to the presentation of research activities.

Quality grade

Satisfactory level of quality

1.5. The higher education institution understands and encourages the development of its social role.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers

The social role of the Faculty is exemplified by various activities that contribute to economic and social development, these include:

- Development and innovation projects implemented at the Faculty (funded by ESIF and the Croatian Agency for SMEs, Innovations and Investments);
- Knowledge transfer to the business community through the supervision of industry-relevant dissertations;
- Efforts to improve student internships within the CeSaR project in order to prepare graduates for the needs of the business community;
- Collaboration with business stakeholders on professional projects;
- The establishment of the spin-off company Comprehensive Water Technology, which is jointly owned by the Faculty and the University of Zagreb;

- Co-organisation of the Fair of Ideas, which aims to establish and strengthen links between the scientific community and the business community;
- Promotion of the Faculty's innovations at fairs and exhibitions;
- Participation in events aimed at popularising science (European Night of Research, Science Festival, Open Days);
- Support of artistic and voluntary activities.

In addition to the activities reported in the self-evaluation document, the collaboration between the faculty and the business community was also confirmed during the meeting with external stakeholders.

Recommendations for improvement

Quality grade

High level of quality

1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers

The Faculty offers various forms of lifelong learning programmes, such as workshops, seminars and lectures, which in some cases are organised in cooperation with other institutions or with the Croatian Society of Chemical Engineers. Lifelong learning programmes meet the needs of society and are mostly without ECTS credits, which can be explained by the fact that there is no professional association for chemical engineers that formally requires them. Lifelong learning programmes are advertised through a dedicated webpage maintained in cooperation with the Croatian Society of Chemical Engineers. The Faculty has established the framework for a regulated lifelong learning system with the adoption of the Ordinance on Lifelong Education Ordinance in 2018. Programmes with ECTS credits require formal accreditation in accordance with the relevant University regulation. Several such programmes are offered, such as the Young

Chemical Engineers Meeting (1 ECTS), the Zagreb Corrosion Summer School (2 ECTS) and the Thermal Analysis Methods Workshop (2 ECTS). The improvement of lifelong learning programmes has been included in the Development Strategy (2021-2031).

Recommendations for improvement

Quality grade

High level of quality

II. Study programmes

2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers

The profile of the study programs offered by the faculty are well aligned with the objectives defined in the current (2014-2025) University of Zagreb Study Strategy, (2021-2031) Faculty of Chemical Engineering and Technology Development Strategy document and to the needs of the society, as explained in the Self-analysis document and confirmed at the site visits. The study programmes are linked to research activities at the university and to industry. From the site visits it was clear that the Faculty's students are readily employable after graduation and that their skills are appreciated by the external stakeholders. Chemical Engineering is not a regulated profession within Croatia, in the sense that there is no formal accreditation of the degree programmes by the relevant professional body (Society/Institute of Chemical Engineers), as would be the case in many other European countries. Despite this there is evidence of a dialogue with the Croatian Society of Chemical Engineers regarding the programme content. The Self-analysis document also present data on employment among students graduating in the years 2016- 2019, wherein 7% of the students analysed (365) were unemployed. This compares favourably with other European countries. The faculty analyses its educational

capacity via an annual self-analysis. However, it was noted that the postgraduate specialist study program petroleum and petrochemical engineering attracts low interest.

Recommendations for improvement

1. Identify key future developments in petroleum and petrochemical engineering and develop the postgraduate program accordingly to increase the attractiveness of this programme, so that it supports industrial transformation in this sector.

Quality grade

High level of quality

2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with alumni
- Meeting with teachers

The programme learning outcomes are aligned with the different study level ordinances at the university and the Faculty's vision as detailed in the 10-year development strategy (2021-2031). The learning outcomes for individual courses are constructed in accordance with Bloom's taxonomy and a clear mapping is evident between such learning outcomes for individual courses and the overall programme learning outcomes. The clarity and appropriateness of the learning outcomes have been evaluated and verified by surveys conducted at university level in 2019/20 with scores of 3.9/5 (undergraduate) and 4.1/5 (graduate) in student satisfaction. However, in this regard the panel noted that the Faculty has not, prior to conducting such surveys, defined a clear threshold at which the response is considered inadequate and remedial action is required.

Study programs are revised so as to align with the CroQF standards through participation in a European funded project (TARGET). Results from surveys and the annual faculty self-analysis, together with feedback from external stakeholders and former students during the site visits, confirm that the intended learning outcomes reflect the competencies

required for employment. Indeed, both alumni and external stakeholders strongly expressed the view that the Faculty's degree programmes gave a firm grounding on which to build a successful professional career.

Recommendations for improvement

Quality grade

High level of quality

2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with students
- Meeting with teachers

A wide variety of standard assessment methods, as outlined in the Self-analysis document, are used to determine the achievement of course and programme learning outcomes. The assessment methodologies are robust and the assessments themselves rigorous. Furthermore, the preparation and defence of the final thesis, at both undergraduate and graduate level, is a key instrument for analysing the attainment of programme learning outcomes. The achievement and appropriateness of the learning outcomes are evaluated through exit surveys of new graduates, as detailed in the Self-analysis document. The high degree of employability of the graduated students in relevant industries making use of the subject knowledge taught in the Faculty's programmes, is a clear sign of the achievement of the intended learning outcomes. In addition, there is evidence that the Faculty instigates a programme of on-going revision of both programme content and learning outcomes in the form of an annual self-analysis. There are strict protocols for study program changes. These protocols allow for minor course changes (< 20%) without close scrutiny while major changes (> 20%) require closer scrutiny and approval. However, there is evidence that many teaching staff keep annual changes to courses below this 20% threshold in order to streamline the approval process and, as such, the protocol may actually act as a barrier to more radical re-evaluation of courses.

Recommendations for improvement

Quality grade

High level of quality

2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers

A revision of the undergraduate and graduate study programmes was initiated in the academic year 2019/ 2020. However, it was then suspended in 2020 due to the global pandemic. The faculty has several processes in place for the further development of its existing study programmes, as detailed in the Self-analysis document and there is evidence for some such changes being made. The system allows for changes based on input from both students and teachers. Changes are updated in the ISVU system, information packages to new students and on the faculty website. However, while the content of the current programme is documented, it is not clear to what extent documentation relating to changes in the programmes are maintained. Moreover, many of these modifications are being directed by individual course teachers and have the appearance of being uncoordinated at programme level, reflecting the lack of an overarching strategy. From various discussions, particularly with external stakeholders, some room for improvement could be identified concerning education in topics such as circular economy, legislation and in soft skills such as public speaking and leadership.

The Faculty runs programmes in four main areas, reflecting its key research strengths. This is a relatively small number for a Faculty of this size and there is no evidence of undue overlap or duplication within the Faculty. The Faculty is aware of the possibility of duplication between its own Applied Chemistry programme and the Chemistry programme run by the Faculty of Science and Mathematics at the University of Zagreb, but has taken steps to review the programme content in order to minimise such overlap.

Recommendations for improvement

1. The strategic revision of the undergraduate and graduate study programmes, halted in 2020 due to the global pandemic, should be reinstated as a matter of urgency.
2. The Faculty is encouraged to integrate more education in soft skills and wider concepts such as the circular economy in to its programmes.
3. The Faculty is encouraged to seek additional input from external stakeholders, beyond the employers' survey, with such feedback being taken into consideration during the course revision process.

Quality grade

Satisfactory level of quality

2.5. The higher education institution ensures that ECTS allocation is adequate.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with students
- Meeting with teachers

The Faculty has analysed the compliance of ECTS credits in reflecting student workload by means of an internal review, including student surveys for both undergraduate and graduate programs in the academic year 2019/2020. The results (scores close to 3/5) indicate that further improvements are needed. A follow up study was conducted in 2020/2021. As a result, the Faculty has a good understanding of where a mismatch between ECTS credits and student workload exist, both for courses with too high a workload for the credits awarded and too low a workload for the credits awarded. Moreover, there are currently no ECTS credits given for the compulsory summer internships. There is currently little evidence of these imbalances being addressed, which was planned to form part of the (currently suspended) wider curriculum review. This should be addressed as a priority.

Recommendations for improvement

1. Where an imbalance between student workload and ECTS credits awarded has been identified, such imbalance should be rectified. All workload, including internships, should benefit in terms of ECTS credits.

Quality grade

Minimum level of quality

2.6. Student practice is an integral part of study programmes (where applicable).

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with external stakeholders
- Meeting with teachers
- Meeting with students

Student practice is implemented in the study programmes via an Internship scheme, comprising a 160-hour summer placement. This is a compulsory part of the undergraduate programmes, however no ECTS credits are awarded. Internships are also integrated in all graduate study programmes. Students can also choose internships within e.g. Erasmus+ programmes advertised on the Faculty website. Feedback is collected through surveys. An application system for graduate internships is under development within the project CeSaR and will also allow for evaluation of internship quality. Reasonable mechanisms appear to be in place to ensure that internship hosts offer an appropriate student experience with the correct balance of skills development and learning opportunities. Students felt that they were offered good support in finding internships based in and around Zagreb, but that support was much more variable for students wishing to take up internships closer to their home towns.

Recommendations for improvement

1. Student practice via internships should be assigned ECTS credits and, as part of this, the Faculty should look at ways in which the internship period could be moved within the core teaching semester.
2. The Faculty should look at ways in which it can offer better support to students wishing to be based outside of Zagreb for their internship.

Quality grade

Satisfactory level of quality

III. Teaching process and student support

3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with students
- Faculty website

The Faculty operates fair and transparent admission procedures which are applied consistently across all programmes of study. Enrollment criteria are defined, with these including the evaluation of success in high school, the level compulsory high school graduation exams, elective exams and additional assessments of knowledge. These criteria are made available via the Faculty web-site. In order to increase the quality of candidates enrolling in undergraduate studies at the Faculty, in the academic year 2019/2020 chemistry was introduced as a compulsory high school graduation exam. Consequently, the background knowledge of students is judged appropriate to the programmes of study upon which they enter, with this being strengthened by the recent changes in admissions criteria. The Faculty has established procedures for recognition of previous learning for students transferring from other institutions or ECTS points acquired during horizontal or international mobility.

Recommendations for improvement

Quality grade

High level of quality

3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Meeting with staff
- Site visit and discussions
- Meeting with students

Procedures are in place for monitoring of student progression on all programmes of study. There is evidence that, where appropriate, measures are put in place to address issues with progression. As an example of one such measure to increase pass and completion rates, in the academic year 2019/2020, chemistry was introduced as a compulsory high school graduation exam. However, the Faculty should further elaborate on the mechanisms in place for the early evaluation of such measures rather than just relying on final graduation rates.

Recommendations for improvement

1. Where action is taken to address issues of student progression, for instance with the introduction of chemistry as a compulsory entry qualification, the success or otherwise of the measure should be evaluated at an early stage, for instance progression between years/levels, not just based upon graduation/completion rates.

Quality grade

Satisfactory level of quality

3.3. The higher education institution ensures student-centred learning.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Meeting with staff
- Site visit and discussions
- Meeting with students

A wide range of teaching methods are utilised, including traditional lecture classes, extensive laboratory class (which are highly regarded and valued by the students), on-line learning and group assignments. There is evidence that the Faculty adjusts teaching methods in accordance with the intended learning outcomes and ensures appropriate integration of teaching methods. Teaching methods employed are adapted to students

with the aim of improving interactive and research-based learning, problem solving and creative thinking. Extensive use is made of surveys to assess student satisfaction and there is evidence of processes being modified in response to student feedback. Internships offer students the opportunity to acquire practical skills and competencies needed for later work. Teachers are encouraged to adapt their courses to e-learning technology by awarding an annual award for best e-learning course.

Students have many opportunities to participate in scientific projects, through final and graduate theses, individually or in groups, and they are enthused by the options offered to them. There is evidence of a year-on-year increases in the availability of such opportunities. There is also evidence of a number of workshops and training activities being organised to encourage good teaching practice. However, these all appear to be voluntary and no central record of attendance at such courses is maintained.

Students have opportunities to express their opinion, give suggestions for improvement and influence the decision-making processes on issues that concern them through representation on most of the Faculty's committees and boards, including the Faculty Council. There is an active student society as part of the Croatian Society of Chemical Engineers. The society organises student conference and workshops, and publishes its own magazine "Reaktor ideja". Such activities are supported financially by the Faculty. Students are also involved in science popularization projects.

Recommendations for improvement

1. Maintain a record of teacher training and ensure all staff participate in training in good teaching practice.
2. Consider an enhanced training programme in all aspects of teaching and assessment for newly appointed teaching staff.

Quality grade

Satisfactory level of quality

3.4. The higher education institution ensures adequate student support.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Site visit and discussions
- Meeting with students

General support and guidance to students is available via a number of sources including the office of the vice-Dean for Education, Heads of Departments, programme coordinators, the student support office and individual teachers. Moreover, each student is assigned an individual mentor, with such mentors being available for counselling. Together these information sources cover the expected range of services (academic, careers, international mobility, ethical guidance etc.) and for the most part such arrangements appear to work adequately for the majority of students. However, it is necessary to work on the overall communication between students and teaching staff, for instance in regard to areas such as the availability of laboratory projects, study abroad opportunities, exam timetables etc.

The panel noted that students receiving support for disabilities (including unseen disabilities such as learning disabilities and mental health problems) are very significantly under-represented in the Faculty (2 in the total student body, < 0.2%, compared to 13-19% across higher education in the EU, US and UK). It was felt extremely unlikely that the incidence of such disabilities in the underlying population for recruitment to tertiary education differed significantly between Croatia and the rest of the EU (or US and UK) and the Panel felt that such under representation must therefore reflect under reporting and/or bias in the recruitment process.

Recommendations for improvement

1. The Faculty must understand why disabled students are so significantly under-represented in the student body and whether its recruitment processes are discourage such applicants. It also needs to understand why current students are reluctant to disclose a disability and seek appropriate adjustment.
2. Anonymous surveys should be conducted upon application of students to join the Faculty to ascertain levels of students with disabilities being admitted. The long term goal for the Faculty should be that the ratio of students with one or more disabilities is commensurate with the levels of disability in the applicant population.

Quality grade

Minimum level of quality

3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Meeting with staff
- Site visit and discussions.

Notwithstanding the comments under 3.4 above, where students with additional needs are identified it appears that for the most part appropriate adjustment to meet such needs are made and that resources for such adjustments are available. However, there seems to be a communication issue, wherein it often falls to the student to seek appropriate adjustment in each class and from each teacher. The panel also noted that there is little adaptation of the Faculty space to the needs of disabled visitors, although it is appreciated that in old buildings such adaptations may prove challenging.

Recommendations for improvement

1. Measures need to be put in place to proactively encourage disabled students to seek appropriate support.
2. Once a student has a statement of required disability support this should be made available, on a need-to-know basis, to staff who have direct teaching contact with that student. The expectation should be that the agreed support will be in place automatically and without it being incumbent on the student to seek such support from each individual teacher.
3. The Faculty should develop a plan for how its space could be adapted to students and staff with disabilities, such as ramps for students or staff in wheelchairs or adjustments for the blind and partially sighted persons. The main entrances to its buildings should be considered a priority in this regard so as to improve accessibility for disabled visitors.

Quality grade

Minimum level of quality

3.6. The higher education institution allows students to gain international experience.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Meeting with staff
- Meeting with students

The Faculty has a reasonable number of Erasmus+ exchange agreements with partner European Universities and there is evidence for outward mobility of the Faculty's students. Although most students were aware of the Erasmus+ scheme, there were some concerns regarding limited communication of opportunities and lack of support for organising exchange visits. It is suggested that additional support is offered to students to join student mobility programs and scientific projects. However, the Faculty is commended for the additional financial support offered to students participating in Erasmus exchange, as well as those attending international conferences. Based on the meeting with alumni representatives working internationally, students are well-equipped with competencies necessary to work in an international environment.

The HEI also ensures the recognition of ECTS credits earned at other higher education institutions. However, students appear to use the study period in foreign host institutions mainly in their final year and to collect additional ECTS credits. There are limited options, or students are not aware of them, for recognition of ECTS credits gained during mobility that may serve as a replacement for courses which are part of a regular study program at the home institution.

Recommendations for improvement

1. Communication with students needs to be improved across a number of areas including advertising Erasmus+ opportunities.
2. The higher education institution should collect additional data on student satisfaction with regard to the quality of student mobility programs.
3. It is recommended that student workshops be development, where Erasmus project participants can share their experiences with other students.

Quality grade

Satisfactory level of quality

3.7. The higher education institution ensures adequate study conditions for foreign students.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Meeting with staff

The higher education institution provides information on the possibilities of enrolment and study to foreign students. A significant number of the Faculty's courses are delivered in English and support to learn the Croatian language is available to incoming foreign students. Since the academic year 2019/2020, the new graduate study programme in English (Chemical and Environmental Technology) is being conducted. Despite this, mobility tends to be predominantly outwards, with relatively small numbers of incoming students, the majority of whom tend to partake in only a part of the programme of study, not the whole. No specific feedback has been collected to gauge the satisfaction of incoming foreign students and the higher education institution should be more dedicated to collecting feedback on the needs and satisfaction of foreign students.

Recommendations for improvement

1. A system of surveying incoming foreign students to ascertain levels of satisfaction with the Faculty's offering needs to be established.

Quality grade

Satisfactory level of quality

3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Meeting with staff
- Meeting with students

A variety of methods are used to assess student learning with these being rigorous and well aligned to the published learning outcomes. There was evidence of exam papers being reviewed within Departments prior to examinations being sat by students, but this process appeared to lack a formal structure. There was also anecdotal evidence of there being occasional errors in the marking of examinations. Although students receive grades on all submitted assignments and are given the opportunity to discuss performance with teaching staff, uptake of such opportunities appears to be low. The panel heard from a number of students who felt they required additional feedback relating to how final grades on assignments had been arrived at, or the required alterations to a piece of work which would allow them to improve subsequent submissions.

Recommendations for improvement

1. The Faculty should consider mandatory written formative feedback on at least a proportion of assignments in each year or study.
2. It is suggested that a formal process for reviewing all examination papers be put in place and for amendments arising from review being recorded.
3. A system for checking that all sections of examination papers have been marked and that such marks tally correctly with the final grade is recommended.

Quality grade

Satisfactory level of quality

3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document

The statutes, ordinances and regulations under which the Faculty operate are clear and the issuance of diplomas and diploma supplements was judged to be fully in accord with such. Upon completion of their studies, the HEI issues appropriate documentation to students in accordance with the relevant regulations.

Recommendations for improvement

Quality grade

High level of quality

3.10. The higher education institution is committed to the employability of graduates.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document
- Meeting with Alumni
- Meeting with external stakeholders

The Faculty has strong links with industry, with evidence of multiple collaborative projects and many of its alumni holding senior managerial positions, either within these industries or within other academic institutions or related professional bodies. The HEI analyses the employability of graduates and employment data are collected and listed. The HEI also maintains contacts with alumni and with the organisations employing them.

Graduates from the Faculty's programmes of study are highly employable with evidence of good employment rates and short lead times between graduation and subsequent employment. In some cases there is evidence that the recently introduced internship scheme helps facilitate this. Former students consider that the Faculty prepares students well for employment, with this being based on the knowledge gained in lectures and laboratory classes. Generally, employers and other external stakeholders similarly felt that students had good technical and laboratory skills and that the Faculty's courses equipped them with a sound theoretical basis. However, employers also identified deficiencies in a number of "soft skill" such as presentation skill, commercial awareness and legal/regulatory frameworks.

Recommendations for improvement

1. The Faculty should initiate focus groups with employers to identify additional skills to enhance graduate employability and implement any such suggestions.

Quality grade

High level of quality

IV. Teaching and institutional capacities

4.1. The higher education institution ensures adequate teaching capacities.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document & analytical supplement
- Meeting with staff

With 63 academic teaching staff to a total student enrolment of 1180 the staff:student ratio of 18,73 comfortably exceeds the minimum requirement. Teachers are

appropriately qualified to deliver the programmes of study and appear to be highly motivated to do so. However, despite the good staff:student ratio, some staff workload falls well outside the expected 300 ± 60 hours norm, with the range reported for academic teaching staff in the Analytic Data Supplement being 19-585. Such an imbalance is a concern, particularly at the high end, as it may impact teaching quality and leaves little scope for research, scholarship or professional development. Teachers seem, for the most part, unwilling to complain about this.

Recommendations for improvement

1. Workload imbalance should be reviewed at Faculty level and a system put in place to reduce the load on the most heavily loaded staff. It is strongly recommended that the absolute cap on teaching hours of 420 hours, as outlined in the provisions of the Collective Agreement, be adhered to.

Quality grade

Satisfactory level of quality

4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures which include the evaluation of excellence.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document & analytical supplement
- Meeting with staff

Processes for recruitment of staff, and those for promotion within the Institution, were found to be robust and fair. The institution applies transparent procedure in selection of new assistant professors where each applicant is scored for his/her previous scientific, teaching and professional activities as well as the future research plan. In this regard, the Faculty is commended for setting recruitment standards that exceed the national minimum levels, thus ensuring a high-quality staff profile.

Recommendations for improvement

Quality grade

High level of quality

4.3. The higher education institution provides support to teachers in their professional development.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document & analytical supplement
- Meeting with staff

There is evidence of a number of workshops and courses being offered to enhance teaching performance and disseminate best practice. However, these appear to be arranged on an *ad hoc* basis and there is little evidence of a coherent staff development strategy. Moreover, as noted elsewhere, attendance at most training is optional and there does not appear to be a record of training attendance being kept.

Robust processes are in place for the collection of student feedback on teachers, but little use appears to be made of peer evaluation of teachers, except in the case of the most junior staff at the start of their teaching careers. There is evidence of international mobility of teaching staff, but it is noted that this relies on either the good will of colleagues to cover teaching or the financial ability of the Departments to buy in teaching cover. This may be a bar to mobility, particularly given the high workload of some staff.

Recommendations for improvement

1. Initiate a formal strategy for staff development so that staff training can be organised in a more coherent and targeted fashion.
2. Consider implementing a peer review system to assess teaching quality.
3. Review arrangements for teaching cover to encourage more staff to take up the opportunity of international mobility.

Quality grade

Satisfactory level of quality

4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document & analytical supplement
- Meeting with staff
- Meeting with students
- On-site & virtual tours

As the Faculty will acknowledge, much of its space is in buildings that are old, too small for purpose and, in some cases, have suffered extensive flood and/or earthquake damage. However, 4.301 m² of available space is well above the minimum requirements. A plan is in place to ultimately move to a new campus, but the timing of this is outside of the Faculty's control. In the interim the Faculty is commended for the way in which it manages its space efficiently so as not to have a negative impact upon teaching. Many of the Faculty's laboratories, despite being small, are equipped to a very high standard, and the Faculty is also commended for the very significant investment it has made in state-of-the-art equipment. Conversely, IT provision is weak in some areas, with lack of out of hours access to specialist software (e.g. via a 24 hour PC cluster or VPN allowing remote access to Faculty software) being an issue for students. The Faculty's virtual learning environment (Merlin) appears to be fit for purpose with regard to both teaching and assessment, with facilities such as randomised question pools for on-line tests being supported. There is however no facility for automatic capture and recording of live lectures (view on demand system), as would be found in many institutions across the EU/UK/US.

Recommendations for improvement

1. Review IT provision, particularly with regard to solutions that would allow student access (either physical or virtual) outside of core hours.
2. The Faculty is encouraged to continue its investments the refurbishment and maintenance of laboratories to replace the worn-out laboratory furniture, fume hoods etc.

Quality grade

Satisfactory level of quality

4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document & analytical supplement
- Meeting with staff
- Meeting with students
- On-site & virtual tours

The library space is poor, being too small and dark to be conducive to scholarship. A reasonable range of electronic resources are available. With regard to print volumes, the library is compliant with the requirement to stock core textbooks at (or exceeding) one per 5 enrolled students, with students also accessing texts from their Department or from individual professors. There is however no dedicated budget to support the library and the acquisition of new resources seems to be on an *ad hoc* basis. The library also supports the repository for doctoral thesis, and it was noted that there appears to have been a hiatus recently in the deposition of theses. It was also noted that there was no usage of library IT as a repository for the Faculty's own publications using the "Green" open access route, whereby most journals will permit the author accepted manuscript (post-refereeing) to be uploaded for open access after a short embargo period.

Recommendations for improvement

1. The Faculty is encouraged to review the usage and support levels for the library
2. The Faculty should ensure a publicly accessible repository of doctoral thesis
3. The Faculty may wish to consider developing a publicly accessible repository for its own research publications using the Green Open Access model.

Quality grade

Minimum level of quality

4.6. The higher education institution rationally manages its financial resources.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Meeting with management
- Self-analysis document & analytical supplement

The Faculty has sound financial plans and a robust accounting and financial management structure. All financial plans are scrutinised by the Faculty Council. Between 2016-19 the Faculty reported a small but growing year-by-year surplus. A deficit was reported in 2020, but this is due to planned expenditure, primarily the repair of earthquake damage to buildings, and should be seen against the backdrop of income that is continuing to grow year-on-year.

Recommendations for improvement

Quality grade

High level of quality

V. Scientific/artistic activity

5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Self-analysis document
- Development Strategy of the Faculty of Chemical Engineering and Technology in Zagreb (2020 -2031)
- Scientific Research Strategic Programme (2015 - 2020)
- Meeting with management
- Meeting with teachers and researcher
- Meeting with stakeholders

During the last five years related to the period of reaccreditation 2016-2021, the Faculty employees have published a total number of 563 articles indexed by WoSCC and Scopus database. This is excellent. The five-year average of all papers published by the full-time academic staff amounts to 1.62 per year per full-time teacher. Despite the efforts and encouragement by the Faculty management, the mobility of academic staff and researchers remains low especially in relation to long term placements. In the last five years, the Faculty received a relatively low number of incoming PhD students, postdocs

and foreign teachers. The Faculty employees actively promote their scientific achievements at national and international conferences. The Faculty has several employees who are highly recognised in the national and international contexts. Undergraduate, graduate and postgraduate students are actively involved in scientific processes alongside their teachers. In the last five years, the Faculty 52 employees published 129 papers with students as co-authors. Also, students of all levels are involved in dissemination activities at scientific conferences.

Recommendations for improvement

1. Introduce an internal peer-review scheme for research papers and project proposal prior to submission to increase the quality of publications and grant applications.

Quality grade

High level of quality

5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Self-analysis document
- Faculty's Development strategy (2015-2020) and Faculty's Development Strategy (2021-2031)
- Faculty's Strategic Programme of Scientific Research (2015 - 2020)
- Meeting with teachers and researchers
- Meeting with alumni
- Meeting with the external stakeholders

The Faculty has developed an adequate number of contracts, agreements and project activities in collaboration with the public sector and economic entities. In addition, the Faculty's employees participate in professional, public and advisory bodies and committees in both the private and public sectors. Additionally, members of the academic staff have been very active in the organisation of numerous conferences that took place both nationally and internationally, as well as in the membership of editorial boards of scientific journals. The total number of peer-reviewed reports of the Faculty staff from 2015 to 2021 is 1134. In the period from 2015 to 2021 the academic ranks of the Faculty staff participated in the work of 57 organising committees for scientific and professional conferences and published 129 peer-reviewed papers at such conference. In the period

2015 –2021, the academic staff of the faculty have delivered 16 keynote lectures at national conferences and 56 at international conferences.

The social engagement of the Faculty is confirmed by projects founded under the Efficient Human Resources programme of the European Social Found (ESF). In one project led by the Faculty of Mining, Geology and Petroleum Engineering of the University of Zagreb: “TARGET – Establishing higher education qualification and professional standards in the field of mining, geology and chemical technology”, the Faculty participated as project partner. The Faculty holds two other such project grants, one relates to its English language graduate study programmes on Chemical and Environmental Technology, and the second is CeSaR. Furthermore, the Faculty is project partner in two other projects with the Croatian Red Cross association and the City Red Cross Society of Zagreb, and in the POZOR! – project on education for sustainable development (part of the call for strengthening of civil society organisational capacity for STEM popularisation). According to the Ordinance on the Organisation of the Faculty of Chemical Engineering and Technology of the University of Zagreb, the Faculty in 2018 established the Office for International Cooperation with two permanent employees. In the 2019. the Faculty Council approved a monetary fund for the foundation of new spin-off companies arising from its staff or student research.

Recommendations for improvement

1. The Faculty should develop a Technology Transfer Strategy aiming to increase cooperation with external stakeholders and the number of spin-off companies resulting from its research activities.
2. The Faculty should advertise widely on the website its successes in Research and Development.

Quality grade

Satisfactory grade of quality

5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Self-analysis document
- Meeting with teachers and researchers
- Faculty website

The Faculty employees actively promote their scientific achievements at national and international conferences. In the last five years, 129 peer-reviewed papers were published at scientific and professional conferences. In the period 2015–2021, the academic staff of the faculty have delivered 16 keynote lectures at national conferences and 56 at international conferences. The Faculty has developed an adequate number of contracts, agreements and project activities in collaboration with the public sector and economic entities. In addition, the Faculty’s employees participate in professional, public and advisory bodies and committees in both private and public sectors. The Faculty has several employees who are highly recognised in the national and international contexts. Additionally, numerous members of the academic staff have been active in the organisation of numerous conferences that took place both nationally and internationally, as well as in the membership of editorial boards of scientific journals. The Faculty has put additional effort in the development of a study program in English in “Chemical and Environmental Technology” with the purpose of increasing its international visibility through the registration of foreign students.

Recommendations for improvement

Quality grade

High level of quality

5.4. The scientific/artistic activity of the higher education institution is both sustainable and developmental.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self analysis documentation:

- Self-analysis document
- Meeting with staff
- Faculty’s Strategic Programme of Scientific Research (2015 - 2020)
- Faculty’s Development strategy (2015-2020) and Faculty’s Development Strategy (2021-2031)
- Meeting with management
- Site visit and discussions

The Faculty is currently proceeding with the procurement of new scientific equipment to complement the current equipment inventory. This on-going action will provide the Faculty with an excellent infrastructure base to deliver high quality research and teaching. The Faculty has already invested significant sums in the reconstruction of laboratories and classrooms. In this area there is still scope for improving the quality of the laboratory

furniture and the general appearance of the laboratory space. Current laboratories are fitted with ageing infrastructure such as fume cabinets, laboratory tables, and ventilation system, many of which have exceeded their expected period of service, and these should be improved or replaced in the near future to facilitate the creation of a competitive research environment. The Faculty lacking a developmental research strategy with clear deliverables and milestones.

Recommendations for improvement

1. The Faculty should develop an openly visible research strategy containing research pillars and/or cross cutting research themes that incorporate the current and future research activities of the Faculty. This should be made visible through its website.
2. The Faculty should develop a research strategy with clear deliverables and milestones over the minimum period of 5 years.
3. The Faculty should maintain investment into the modernisation of its Student and Research laboratories.
4. The Faculty should develop a maintenance plan for its research facilities and instrumentation.

Quality grade

Satisfactory grade of quality

5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.

Analysis

Evidence gathered during the onsite and virtual visit and indicators from the Self-analysis documentation:

- Self-analysis document
- Meeting with staff
- Meeting with students
- Site visit and discussions

Space and equipment for scientific research and professional activities is also used for teaching at undergraduate, graduate and postgraduate level. In the last five years students have co-authored 168 published papers. In the framework of the scientific and professional projects, students in the undergraduate and graduate study programmes have produced 299 undergraduate and graduate theses. In last five years 69 students enrolled in the postgraduate doctoral study programme are in the process of completing their Ph.D. theses.

Recommendations for improvement

1. Standardize the tuition fees of all postgraduate students regardless of the nature of the project funding their graduate study.

Quality grade

Satisfactory grade of quality

APPENDICES

1. Quality assessment summary - tables

Quality grade by assessment area

<i>Assessment area</i>	Unsatisfactory level of quality	Minimum level of quality	Satisfactory level of quality	High level of quality
<i>I. Internal quality assurance and the social role of the higher education institution</i>			X	
<i>II. Study programmes</i>			X	
<i>III. Teaching process and student support</i>			X	
<i>IV. Teaching and institutional capacities</i>			X	
<i>V. Scientific/artistic activity</i>			X	

Quality grade by standard

<i>I. Internal quality assurance and the social role of the higher education institution</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
1.1. The higher education institution has established a functional internal quality assurance system.			X	
1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.			X	
1.3. The higher education institution supports academic integrity and freedom, prevents all types of unethical behaviour, intolerance and discrimination.			X	
1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).			X	
1.5. The higher education institution understands and encourages the development of its social role.				X
1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.				X

Quality grade by standard

<i>II. Study programmes</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.				X
2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.				X
2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.				X
2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.			X	
2.5. The higher education institution ensures that ECTS allocation is adequate.		X		
2.6. Student practice is an integral part of study programmes (where applicable).			X	

Quality grade by standard

<i>III. Teaching process and student support</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.				X
3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.			X	
3.3. The higher education institution ensures student-centred learning.			X	
3.4. The higher education institution ensures adequate student support.		X		
3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.		X		
3.6. The higher education institution allows students to gain international experience.			X	
3.7. The higher education institution ensures adequate study conditions for foreign students.			X	
3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.			X	
3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.				X
3.10. The higher education institution is committed to the employability of graduates.				X

Quality grade by standard

<i>IV. Teaching and institutional capacities</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
4.1. The higher education institution ensures adequate teaching capacities.			X	
4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures which include the evaluation of excellence.				X
4.3. The higher education institution provides support to teachers in their professional development.			X	
4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.			X	
4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.		X		
4.6. The higher education institution rationally manages its financial resources.				X

Quality grade by standard

<i>V. Scientific/artistic activity</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.				X
5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.			X	
5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.				X
5.4. The scientific / artistic activity of the higher education institution is both sustainable and developmental.			X	
5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.			X	

2. Site visit protocol

Edukacija članova stručnog povjerenstva u virtualnom okruženju/Education of panel members in virtual form

	Ponedjeljak, 28. veljače 2022.	Monday 28th February 2022
09:00 -	<ul style="list-style-type: none">• Predstavljanje AZVO-a• Predstavljanje sustava visokog obrazovanja u RH• Postupak reakreditacije• Standardi za vrednovanje kvalitete • Kako napisati Završno izvješće• Priprema povjerenstva za posjet visokom učilištu (rasprava o Samoanalizi i popratnim dokumentima)	<ul style="list-style-type: none">• Presentation of ASHE• Overview of the higher education system in Croatia• Re-accreditation procedure• Standards for the evaluation of quality • How to write the Final report• Preparation of the Expert Panel members for the site visit (discussion on the Self-evaluation report and supporting documents)

Preliminarni posjet Stručnog povjerenstva visokom učilištu / Preliminary site visit of expert panel members to the HEI

	Ponedjeljak, 7. ožujka 2022.	Monday, 7th March 2022
8:50 – 9:00	Spajanje dijela članova Povjerenstva na poveznicu (link) ZOOM	Joining the part of the Expert Panel members to the ZOOM meeting via link
9:00 – 10:00	Sastanak članova stručnog povjerenstva s dekanom i prodekanima	Meeting of Expert Panel members with the Dean and Vice-Deans
10:00 – 10:10	<i>Pauza</i>	<i>Break</i>
10:10 – 11:00	Sastanak članova stručnog povjerenstva s Povjerenstvom za upravljanje kvalitetom	Meeting of Expert Panel members with the Quality Management Commission
11:00 – 13:30	Obilazak fakulteta (predavaonice, informatičke učionice, knjižnica, laboratoriji, studentske službe) i prisustvovanje nastavi	Tour of the Faculty (classrooms, computer classrooms, library, labs, student services) and participation in teaching classes
13:30 – 15:00	<i>Radni ručak</i>	<i>Lunch break</i>
15:00 – 16:30	Analiza dokumenata	Document analysis
16:30	Povratak članova stručnog povjerenstva kućama	<i>Return of members of the expert panel to their homes</i>

Zoom sastanak članova stručnog povjerenstva / Zoom meeting of the expert panel members

	Utorak, 8. ožujka 2022.	Tuesday, 8 th March 2022
10:00- 12:00	Virtualni sastanak članova stručnog povjerenstva, diskusija o zapažanjima i impresijama s preliminarnog posjeta, dodatna priprema za online sastanke	Virtual meeting of the Expert Panel members, discussion of observations and impressions from the preliminary visit, additional preparation for our online meetings

Prvi dan reakreditacije u virtualnom okruženju / First day of re-accreditation in virtual form

	Srijeda, 9. ožujka 2022.	Wednesday, 9 th March 2022
10:20 - 10:30	Spajanje na poveznicu (link) ZOOM	Joining ZOOM meeting via link
10:30 - 11:30	Sastanak članova stručnog povjerenstava s prodekanicom za nastavu	Meeting of Expert Panel members with Vice Dean for Education
11:30 - 11:45	<i>Pauza</i>	<i>Break</i>
11:45 - 12:45	Sastanak članova stručnog povjerenstva s pročelnicima zavoda	Meeting of Expert Panel members with heads of departments
12:45 -13:45	<i>Pauza, za ručak</i>	<i>Lunch break</i>
13:45- 14:45	Sastanak s nastavnicima (u stalnom radnom odnosu, osim onih na rukovodećim mjestima)	Meeting with full-time employed teachers, except those in managerial positions
14:45 - 15:00	<i>Pauza</i>	<i>Break</i>
15:00 - 15:45	Organizacija dodatnog sastanka o otvorenim pitanjima – prema potrebi	Organisation of an additional meeting on open questions, if needed

Drugi dan reakreditacije u virtualnom okruženju / Second day of re-accreditation in virtual form

	Četvrtak, 10. ožujka 2022.	Thursday, 10th March 2022
9:20 – 9:30	Spajanje na poveznicu (link) ZOOM	Joining ZOOM meeting via link
9:30 – 10:30	Sastanak s: <ul style="list-style-type: none"> • ECTS koordinatorom • Povjerenikom za stručnu praksu • Predstavicima Centra za savjetovanje i razvoj karijera studenata • Voditeljicom ureda za međunarodnu suradnju • Predsjednikom Etičkog povjerenstva • Voditeljem knjižnice • Koordinatoricom za studente s invaliditetom 	Meeting with: <ul style="list-style-type: none"> • ECTS coordinator • Commissioner for Professional Practice • Representatives of Advisory and Students' Career Development Centre • Head of Office for International Cooperation • Head of the Ethics Committee • Head of library • Coordinator for students with disabilities
10:30 – 10:45	<i>Pauza</i>	<i>Break</i>
10:45 – 11:45	Sastanak sa studentima	Meeting with students
11:45 – 12:45	<i>Pauza za ručak</i>	<i>Lunch break</i>
12:45 – 13:30	Sastanak s alumnijima (bivši studenti koji nisu zaposlenici visokog učilišta)	Meeting with Alumni (former students who are not employed by the HEI)
13:30 – 13:45	<i>Pauza</i>	<i>Break</i>
13:45 – 14:45	Sastanak s vanjskim dionicima (predstavnici strukovnih i profesionalnih udruženja, poslovna zajednica, poslodavci, stručnjaci iz prakse)	Meeting with external stakeholders
14:45 – 15:30	Organizacija dodatnog sastanka o otvorenim pitanjima – prema potrebi	Organisation of an additional meeting on open questions, if needed

Treći dan reakreditacije u virtualnom okruženju / Third day of re-accreditation in virtual form

	Petak, 11. ožujka 2022.	Friday, 11th March 2022
8:50 – 9:00	Spajanje na poveznicu (link) ZOOM	Joining ZOOM meeting via the link
9:00 – 10:00	Sastanak članova stručnog povjerenstava s prodekanicom za znanost i međunarodnu suradnju	Meeting with the Vice-Dean for Science and International Cooperation
10:00 – 10:15	<i>Pauza</i>	<i>Break</i>
10:15 – 11:00	Sastanak s voditeljima znanstvenih projekata	Meeting with the Heads of research projects
11:00 – 11:10	<i>Pauza</i>	<i>Break</i>
11:10 – 11:55	Sastanak s asistentima i poslijedoktorandima	Meeting with Teaching Assistants and postdoctoral researchers
11:55 – 12:55	<i>Pauza za ručak</i>	<i>Lunch break</i>
12:55 – 13:40	Organizacija dodatnog sastanka o otvorenim pitanjima – prema potrebi	Organisation of an additional meeting on open questions, if needed
13:40 – 14:10	Interni sastanak članova stručnog povjerenstva	Internal meeting of the Expert Panel members
14:10 – 14:20	Završni sastanak s dekanom i prodekanima	Exit meeting with the Dean and Vice-Deans
14:20 -	Interni sastanak članova stručnog povjerenstva – ocjenjivanje prema temama i standardima kvalitete	Internal meeting of the Expert Panel members – assessing quality assesment areas and standards

SUMMARY

Overall the panel felt that the Faculty of Chemical Engineering and Technology provided its students with a strong education, firmly grounded in the fundamentals of the discipline. The Faculty's graduates are, as a consequence, highly employable with short lead-times between graduation and employment and a skill set that is appreciated by employers. The panel also noted that many of the Faculty's alumni now hold senior positions within industry, other HEI's or professional bodies, which is a clear indicator of the quality of the education provided. We also heard from alumni working abroad who felt the education they received was equal to that offered elsewhere in the EU.

Learning outcomes for the programmes offered by the Faculty were found to be equivalent to those of comparable institutions across the EU and both teaching and assessment of the courses was judged to be aligned with the learning outcomes. Rigorous quality assurance processes are in place and there is evidence of changes being made in response to issues being identified. The Faculty staff are well qualified to deliver the programmes they teach upon and the Faculty is commended for setting recruitment standards that are in excess of the national minimum levels.

Laboratories were found to be equipped to a very high level and there is a clear emphasis on laboratory work which is valued by the students. Many of the teaching staff have a high research standing and there is a good level of high-quality research publications being produced by the Faculty's staff. This is reflected in the large, and growing, number of research projects held by the Faculty's staff, with a range of funding sources including national Government, EU and local industry.

There are however some key areas for improvement that have been highlighted by the re-accreditation process. Teaching workloads for some staff appear excessive and efforts need to be made to balance some quite extreme differences in teaching workload. As a minimum, the 420 hours cap, as established by the provisions of the Collective Agreement, should be adhered to. Mechanisms for giving feedback to students need to be reviewed and it is suggested that students at all levels of study be offered written formative feedback on at least a proportion of the assignments they are required to submit. At < 0.2%, students with one or more disability (including unseen disabilities) are very significantly underrepresented in the student body and the Faculty needs to urgently understand why this is the case and put in place measures to ensure the composition of its student body reflects that of the wider society it serves. The Faculty also needs to address issues around communication, both with its own students and with wider society, with much of the information on its website being out of date, difficult to find or simply missing. This should be seen as an opportunity to publicise the very significant successes it is having in its research activities.