QUALITY ASSURANCE PLAN OF THE DOCTORAL SCHOOL OF CHEMISTRY

The aim of the doctoral (PhD) training

Applicants to our doctoral programme primarily hold degrees in chemistry, chemical engineering, chemistry teaching or pharmacy, but we have also admitted students with degrees in biochemical engineering and biotechnology, both from Hungary and abroad. The Stipendium Hungaricum Scholarship Programme aims to internationalise Hungarian higher education and attracts applicants from more than 90 countries worldwide. The Doctoral School of Chemistry aligns with this goal by offering training in English.

Through theoretical and practical training, doctoral students become familiar with important issues within a chosen subfield of chemistry. They conduct experimental and theoretical research to explore known problems within their topic areas and to achieve new research objectives. In doing so, they acquire the essential methodological knowledge required for scientific research.

Training (output) competencies

Upon completion of the program, doctoral students will be able to conduct independent research and plan and execute research based on professional literature. They will be familiar with and able to apply modern research methods and interpret measurement results in a well-founded manner. They will publish their research findings in international journals. They will apply their knowledge in the fields of basic and applied research, while also protecting the environment.

1. Announcement of doctoral research topics

Since its establishment, the Doctoral School of Chemistry (KTDI) has regarded supervisors as the key to successful doctoral training. An instructor or researcher holding a scientific degree may become a supervisor in the Doctoral School of Chemistry if they have demonstrated their suitability through their previous scientific and teaching achievements, as well as through their participation in the doctoral programme, and if their topic proposal has been approved by the Council of the Doctoral School of Chemistry (KTDIT).

In each admission period, a maximum of three new doctoral students may be admitted under one supervisor, depending on the supervisor's scientific degree. The Council of the Doctoral School may request an exemption from this limitation from the Scientific Doctoral Council (TTDT) in justified cases. University professors, scientific advisors, and Doctors of the Hungarian Academy of Sciences may not supervise more than eight state-funded doctoral students at the same time. In the case of habilitated assistant professors/associate professors and research fellows/senior research fellows, the Doctoral School Council supports the supervision of at most two students simultaneously; in all other cases, only one doctoral student may be supervised.

For researchers returning from abroad (e.g., Lendület programme researchers), supervision is permitted if they demonstrate research achievements equivalent to habilitation, and they may supervise at most two students simultaneously. In making admission recommendations, the Council also considers the supervisor's previous effectiveness in similar roles.

A supervisor may take on additional students beyond the above quotas if they can document the successful progression of their active PhD students' research work. This may be requested no earlier than the semester following the complex examination, subject to individual assessment by the KTDI. The KTDIT may authorise supervision beyond the quota for self-funded, Stipendium Hungaricum, or other scholarship-supported students whose research funding is ensured by the sponsor.

Supervisor registration may be initiated no earlier than five years after obtaining the PhD degree. The KTDIT decides on the acceptance of the supervision request, taking into account the availability of the financial resources required for sustaining the planned research within the PhD training, as well as the candidate's previous experience supervising BSc or MSc students. In justified cases, based on individual assessment, the Council may deviate from the five-year requirement.

The announcement of a new research topic must be approved by the Council of the Doctoral School of Chemistry (KTDIT), for which we have developed a formal system of conditions for announcing and approving doctoral research topics.

Before each new doctoral admission round, supervisors may initiate the announcement of a new doctoral research topic by completing and submitting the form available on the Doctoral School's website:

(https://chemistryphd.unideb.hu/sites/default/files/inline-files/temakiiras.docx). In addition to the description of the proposed doctoral research topic, the application must include a brief description of the equipment and financial resources required to carry out the work. Upon a positive decision by the KTDIT, the new topics are announced on the ODT website (http://www.doktori.hu).

In the case of an external supervisor, the KTDIT - based on the recommendation of the head of the relevant doctoral programme - must appoint a co-supervisor. The Doctoral School Council supports dual supervision only in exceptionally justified cases. The decision on co-supervision is made by the University Doctoral and Habilitation Council (EDHT) on the basis of a request submitted to the Scientific Doctoral Council (TTDT). The required form can be downloaded from the website of the Doctoral School:

https://chemistryphd.unideb.hu/sites/default/files/inline-files/Application%20for%20permission%20for%20co-supervision.docx.

2. Admission to the doctoral training

Admission to the doctoral programme is only possible by applying for a research topic announced nationwide on the website www.doktori.hu and by successfully completing an interview before the admissions committee. Applicants can find all information related to the admission process on the website of the Doctoral School of Chemistry (KDI): https://chemistryphd.unideb.hu/en/admission-information

In the application, the applicant must indicate the name of the prospective supervisor and the title of the chosen topic, and must provide a brief summary of their preliminary research concept. The proposed supervisor must review and approve this. A written statement of acceptance from the supervisor is a prerequisite for participating in the admission interview. The supervisor's recommendation must be included on the admission form required by the Scientific Doctoral Council (TTDT).

The admissions committee - usually consisting of the head of the doctoral school, the heads of the doctoral programmes, and one external member delegated by another doctoral school - conducts a professional interview with each applicant. The committee awards points in three categories, as specified in Annex 3 of the Doctoral Regulations of the University of Debrecen:

up to 40 points for professional aptitude, up to 30 points for the degree, and up to 30 points for previous scientific work (publications, student research papers, presentations). No points are awarded for degrees obtained more than two years earlier; in such cases, the maximum points for the remaining two categories increase by fifteen each. The minimum total score required for admission is 60.

The language requirements for admission are clearly defined in the referenced guidelines and regulations. For foreign applicants, the scoring system and language requirements may differ.

After the admission exam, applicants are ranked according to their scores. The state-funded doctoral scholarships available to the Doctoral School of Chemistry - which vary slightly each year - are offered to those with the highest scores. Applicants who perform adequately but do not receive a state scholarship may still be admitted as doctoral students if other sources of funding are available (typically provided by industrial partners).

3. Courses in the doctoral programme

In the Doctoral School of Chemistry, only those instructors and researchers with a scientific degree who are considered suitable by the KTDI and are appointed for a given period may teach doctoral courses. The instructors of the Doctoral School (92 persons) are listed in the ODT database (doktori.hu). If an instructor teaches in more than one doctoral school, they must declare in their ODT profile what percentage of their activity belongs to each school.

All instructors of the Doctoral School of Chemistry have the right to propose new courses or withdraw previously offered ones. Proposals to include a new course in the training programme must be submitted in writing to the School Council before the start of the semester. The proposal must include the course title, teaching format, assessment method, credit value, and a brief description of the course content. The required form can be downloaded from the Doctoral School's website:

https://chemistryphd.unideb.hu/sites/default/files/inline-files/uj_tantargy_bejelentese.doc

Decisions on adding new doctoral courses to the curriculum, as well as on reviewing and either continuing or discontinuing existing courses, are made by the KTDI.

A weekly 2-hour doctoral lecture course running for one semester (including an exam) is generally worth 2 credits. These courses are particularly useful for students who did not

encounter certain essential chemical knowledge during previous studies (e.g., students from environmental science or pharmacy programmes who may not have studied advanced instrumental analytical methods). With the exception of the "General Research Skills" course, the Doctoral School of Chemistry does not prescribe compulsory curricular courses. Doctoral students may freely choose from the offered courses, considering the recommendation of their supervisor. The complete list of available doctoral courses can be found in the database on the Doctoral School's website:

https://chemistryphd.unideb.hu/en/elective-subjects-doctoral-school-chemical-sciences

4. Research work

Doctoral students complete the experimental or theoretical research underlying their dissertation over eight semesters, during which they must earn 196 research credits in full-time study or 228 credits in part-time (correspondence) study.

The financial background for the student's research is provided by the supervisor, who is also responsible for directing and overseeing the student's research work. The Doctoral School regards the progress of research work as primarily the responsibility of the supervisor and relies on the supervisor's personal judgement. Each semester, doctoral students must prepare a written report on the progress of their research, with annual reports linked to a compulsory course. The necessary forms are available on the Doctoral School's website. Reports must be sent to the head of the doctoral school.

Research credits are certified in the Neptun system by the supervisor, based on the written report, by signing the course code and credit value listed in Annex 1 of the KDI Operational Regulations.

https://chemistryphd.unideb.hu/sites/default/files/inline-files/Research%20report.docx
Research work is assessed and graded on a five-level scale.

Supervisors are encouraged to ensure that doctoral students give at least one professional presentation each year on their research results, preferably at an international professional forum.

5. The complex examination

The complex examination is taken at the end of the fourth semester as the conclusion of the "training and research phase" of the doctoral programme and as a prerequisite for starting the "research and dissertation phase." It assesses and evaluates the student's academic and research progress.

Eligibility for the complex exam requires earning at least 90 credits during the first four semesters ("training and research phase") and completing all "training credits" prescribed by the doctoral school's curriculum. Since passing the complex examination marks the student's entry into the degree award procedure, applying for the complex exam also constitutes applying for the degree procedure.

The complex exam must be taken publicly before a committee appointed by the Doctoral Council of the Doctoral School of Chemistry and approved by the disciplinary doctoral council. The examination committee consists of at least three members, at least one-third of whom must not be employed by the institution operating the doctoral school. The chair of the committee must be a university professor, habilitated associate professor, habilitated college professor, Professor Emeritus, or a Doctor of the Hungarian Academy of Sciences. All members of the committee must hold a scientific degree. The student's supervisor may not be a member of the committee.

Before the exam, the supervisor must evaluate the student's performance in writing and state whether they support the initiation of the degree award procedure.

The complex examination consists of two main parts: the theoretical part assessing the student's academic preparation, and the dissertation part assessing the student's scientific progress. In the theoretical part, the student demonstrates their knowledge of the relevant scientific literature as well as current theoretical and methodological expertise. The student must take exams in at least two subjects/topic areas, as listed in the doctoral school's training plan. The subjects and their syllabi are defined by the doctoral school council and published on the KTDI website (KTDI Operational Regulations, Annex 5).

In the second part of the exam, the student presents their literature background, research results, research plan for the second phase of their doctoral training, and the schedule for completing the dissertation and publishing the results. The supervisor must be given the opportunity to evaluate the student during the examination.

The committee evaluates the theoretical and dissertation parts separately. A written record including a textual evaluation is prepared (see Annex 5/1 of the Doctoral Regulations of the University of Debrecen). The result must be announced on the day of the oral examination. The exam is considered successful if the majority of the committee members evaluate both parts as successful. A failed complex exam may be retaken once in the same examination period.

The doctoral student may enrol for the fifth semester only after successfully passing the complex examination.

6. Monitoring

The Council of the Doctoral School of Chemistry (KTDIT) continuously monitors and evaluates the academic performance and progress of doctoral students on the basis of the written research reports and annual reports submitted, as well as presentations given at departmental seminars and various professional forums.

In the 1st, 3rd, 5th and 7th semesters of the doctoral training, only a research report must be prepared, while in the 2nd, 4th, 6th and 8th semesters an annual student report must be submitted. The Research report corresponds to Annex 2.1 of the KTDI Operational Regulations, and the Annual report to Annex 2.2. Both forms can be downloaded individually from the Doctoral School's website at the following addresses:

https://chemistryphd.unideb.hu/sites/default/files/inline-files/Research%20report.docx

https://chemistryphd.unideb.hu/sites/default/files/inline-files/Annual%20report.docx

The annual work report contains aggregated indicators of academic and research results (including publications related to the doctoral topic, conference and seminar presentations). The submission deadline for both types of report is the last day of the given teaching period. The KTDIT evaluates the student reports, requests further information if necessary, and provides appropriate feedback. The result of the compulsory annual evaluation is recorded in the student's doctoral training record in the Neptun system.

7. Publication requirements for the PhD degree

The Doctoral School of Chemistry considers a doctoral dissertation professionally acceptable only if, at the time of submission, at least two publications based on the research underlying the dissertation have appeared in internationally refereed, Scimago-ranked journals with an impact factor. These publications must have a DOI number, or be available in page-proof form, or be confirmed by the journal's editor as accepted for publication.

In the case of a doctoral dissertation prepared in the field of subject-specific methodology (chemistry education), the generally expected minimum requirement is two foreign-language articles published in internationally refereed, Scimago-ranked journals (with DOI number, or available in page-proof form, or confirmed by the journal's editor as accepted for publication).

It is a basic requirement that at least one of the published papers should have been prepared with the candidate's substantial contribution. The papers may have co-authors, including the candidate's supervisor. If two or more doctoral candidates are co-authors of a given paper, the supervisor must declare to what extent (in what percentage) the results used in the dissertation reflect the contribution of the given candidate.

The Doctoral School of Chemistry does not accept articles published in journals identified as having questionable publication practices among the publications to be considered for the dissertation. Journals on the so-called "Norwegian list" can be checked on the MTMT website: https://www.mtmt.hu/kifogasolhato_folyoiratok_2025
The Doctoral School of Chemistry applies this restriction to dissertations submitted after 1 March 2025. It is important to note that if a journal was added to the list only after the submission of the paper, its use is still accepted.

The publication requirement system of the Doctoral School of Chemistry was approved by the Senate of the University of Debrecen, upon the recommendation of the University Doctoral and Habilitation Council (EDHT), as part of the University Doctoral Regulations. As part of the KTDI Operational Regulations, the requirements are publicly available both on the website of the Doctoral School and on www.doktori.hu.

8. Language proficiency requirements

In the Doctoral School of Chemistry, a condition for the award of the degree is that the candidate possesses the language skills necessary for working in the discipline, as follows:

- at least intermediate-level proficiency in English;
- if the candidate has intermediate-level proficiency in one of the following languages: German, French, Spanish or Russian, then the language requirement for the degree is that, in English, they fulfil one of the following conditions:
  (a) hold at least one state-recognised, at least basic (entry-level) complex language examination (equivalent to level A2 of the Common European Framework of Reference of the Council of Europe), or
  (b) an equivalent recognised (nostrified) language examination, or
  (c) have passed a language final examination at the University, or
  (d) possess a certificate issued by any language teacher group of the University of Debrecen attesting to professional language proficiency at entry level A2.

The ways of certifying the language proficiency necessary for working in the discipline are:

- a state-recognised, at least intermediate-level (equivalent to level B2 of the Common European Framework of Reference of the Council of Europe) complex language examination (certifying both oral and written skills, formerly “type C”) or an equivalent recognised/nostrified examination;
- a degree as a language major or specialised translator in the given language;
- a secondary school-leaving certificate or a master’s degree obtained in the given language;
- a certificate issued by the Foreign Language Centre of the Faculty of Medicine (ÁOK), the Foreign Language Centre of the Faculty of Humanities (BTK), or the Institute of Business Language Communication of the Faculty of Economics (GTK) of the University of Debrecen;
- fulfilment of the foreign language professional requirements in a master’s programme of the Faculty of Science and Technology of the University of Debrecen.

The language proficiency required for working in the discipline must be certified no later than at the time of submitting the doctoral dissertation.

9. Degree award procedure

Before the dissertation is finalised, it must be submitted for a preliminary defence in the manner specified in the quality assurance plan of the doctoral school. The preliminary defence is organised by the council of the doctoral school, and minutes are taken of the defence. The chair and members of the preliminary defence committee are appointed by the council of the doctoral school. The rules of the preliminary defence can be found on the KTDI website: https://chemistryphd.unideb.hu/sites/default/files/upload_documents/10._elozetes_vita_szabalyai_kdi.pdf

Before the reviews are prepared, the dissertation submitted for the preliminary defence is sent by the secretary of the doctoral school to the University and National Library for text similarity checking. In their written reviews, the referees are required to declare whether, on the basis of the available data, the dissertation meets the publication ethics requirements. If a referee raises an objection on publication ethics grounds during the preliminary defence, the disciplinary doctoral council must be informed of this when the final dissertation is submitted. In such a case, the final dissertation must again be subjected to text similarity checking, and the result must be forwarded to the official reviewers.

Before initiating the defence procedure, the doctoral candidate must upload their articles and publications to the Publication Database of the University and National Library of the University of Debrecen (DEA). Based on the uploaded publications, the Library prepares and certifies the candidate's publication list, which must be submitted to the Scientific Doctoral Council (TTDT) together with the theses and the dissertation.

The rules for evaluating the dissertation and conducting the public defence (in harmony with the Doctoral Regulations of the University of Debrecen) are set out in detail in the KDI Operational Regulations. From a quality assurance perspective, an important element is that the defence committee is appointed by the TTDT on the recommendation of the KTDI. The following form is used for appointing the defence committee: https://chemistryphd.unideb.hu/sites/default/files/inline-

files/Recommendation%20for%20the%20composition%20of%20the%20doctoral%20%28PhD%29%20defense%20committee_0.doc

When the public defence is announced, the dissertation and the thesis booklet are made available on the website www.doktori.hu, and the defence is also announced on the website of the Doctoral School: https://chemistryphd.unideb.hu/en/defenses

In the case of a closed defence, the candidate uploads the dissertation and the theses to the Publication Database of the University and National Library of the University of Debrecen, after which the secretary of the school restricts access to the documents for a specified period. During the defence, all participants sign a confidentiality statement, which must be attached to the minutes of the defence. The procedure and the decision-making process of the closed defence are identical to those of the public defence. The minutes of a closed defence are not public, and no copies may be issued.

10. Final remarks

One of the most important public elements of our quality assurance system is the website of the Doctoral School of Chemistry, available at: https://chemistryphd.unideb.hu/en

Another important element in ensuring transparency, representation of interests, and feedback is that a doctoral student is a member of the KTDI with the right to participate in discussions; this student representative is elected by the students of the school themselves.

To learn about the opinions of doctoral students and their suggestions regarding the training, we occasionally organise Student Forums.

Our continuously developing quality assurance system has contributed significantly to the fact that, in the nearly 30 years between the launch of the organised doctoral (PhD) training and 2025, a total of 285 doctoral degrees have been awarded to students who completed their studies within the framework of the Chemistry Doctoral Programme and later the Doctoral School of Chemistry.

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