

# VADEMECUM PhD STUDENTS in CHEMISTRY – 41<sup>st</sup> cycle

November 2025

*This document contains information about some relevant obligations and procedures that can be helpful during the PhD career. Please note that this document is not an exhaustive list of all obligations, deadlines and formalities.*

Many relevant information, including obligations and deadlines for which PhD students are solely responsible, can be found in the dedicated intranet section at the link

<https://intranet.unibo.it/Ricerca/Pagine/Dottorandi.aspx>

## SECTION 1 – GENERAL INFORMATION

**COURSES:** it is mandatory to attend, during the three years, courses for at least 8 credits (CDs); these credits can be fulfilled attending courses offered by UNIBO (bachelor, master, or PhD courses). The PhD school in Chemistry offers a selection of specialized courses for different chemistry sectors, of training on (inter)departmental equipment and on transdisciplinary skills (see below Section 4), which take place in the period May-September.

### SAFETY COURSES:

Modulo 1 e 2 – [Unibo Intranet - Formazione obbligatoria su sicurezza e salute sul lavoro](#)

Modulo 3 - rischio chimico per dottorandi 41° ciclo

**SEMINARS:** PhD students are strongly encouraged to attend seminars and scientific meetings organized within the departments, the university and in the whole Bologna area. At least 3-5 seminars should be attended each year and listed in the annual report. To report attended seminars please prepare a table with the following information:

Seminar Title | Presenter | Organizer/Institution | Date and Place

The table – and the whole annual report – will be validated by the PhD supervisor. The list of seminars will be uploaded on the app “dottorandi.unibo.it” at the end of the year to obtain the doctoral credits (see below).

**SCHOOLS and CONFERENCES:** it is an obligation to participate, during the three years, in at least one (possibly international) conference and/or school. *(It is no longer necessary to ask for the authorization from the doctorate coordinator).*

**PERIOD ABROAD:** all PhD students are required to spend a period abroad of at least 6 months; we suggest to schedule this period during the second or beginning of third year, to allow a smooth start of activities in the first year and to avoid overlap with finalization of the work and writing of the PhD Thesis. Additional obligations on periods abroad and/or in companies may be related to the kind of scholarship that they have received. *Ask for the authorization from the PhD coordinator and the deputy with adequate advance (form available online at <https://phd.unibo.it/chimica/en/forms-practical-info>). Please, remember that an invitation letter is required by the host institution (see <https://phd.unibo.it/chimica/en/forms-practical-info>).*

**ANNUAL REPORTS:** PhD students will undergo an evaluation at the end of each year of activities before being admitted to the next year or to the final exam. Each student is requested to prepare a report at the end of the year of activity, with a short (approximately, three pages) description of the activities performed,

including a list of the didactic and dissemination activities (attended courses, seminars and schools, conferences, meetings, events...) carried out during the year. The report must be uploaded on the website dottorandi.unibo.it (the template is available online at <https://phd.unibo.it/chimica/en/forms-practical-info>). The student will also deliver, after the first and second year of activity, an oral presentation in front of a nominated committee that will provide hints on how to improve the quality of the PhD pathway during the next year(s).

**Admission to the final examination** of the PhD will be subjected to evaluation of a final report provided by the candidate (to be uploaded to dottorandi.unibo.it; template available online at <https://phd.unibo.it/chimica/en/forms-practical-info>) and a commentary report ("Medaglione") provided by the PhD supervisor (that will be sent to the PhD council). Formal rules for PhD thesis submission, evaluation by external reviewers and the final examination, together with related deadlines, are published by the doctoral office in the Intranet at the link <https://intranet.unibo.it/Ricerca/Pagine/Dottorandi.aspx>. PhD students are responsible for the observation of all obligations and deadlines.

## SECTION 2 – How to ASK AUTHORIZATION for:

- **Short Business Trip** (conferences, schools, meetings, short periods abroad etc.):

It is no longer needed to ask for authorization from the PhD coordinator. You only need to contact the administration of your department for reimbursement purposes. Therefore, your supervisor is the best person to ask for hints about the procedures.

- **Period Abroad** (research periods typically of several months).

Send an email to the coordinator (Cristina Puzzarini) and the deputy (Damiano Genovese), putting in cc the PhD Supervisor, asking for authorization and including (1) a letter of invitation from the hosting group and (2) the filled form available online at <https://phd.unibo.it/chimica/en/forms-practical-info>. The coordinator will provide you with the authorization, which will be formally approved by the next available “Collegio dei Docenti” (PhD council).

- **Tutoring in academic courses.**

Remunerated tutoring activities must be authorized by the PhD council. Therefore, you have to proceed as follows:

- 1) Send all required information to the coordinator and vice-coordinator. The details are provided in the next bullet point (“Remunerated activities compatible with PhD course”).
- 2) Upload the request on the specific section of [dottorandi.unibo.it](https://dottorandi.unibo.it), that should be approved by the Supervisor and by the Coordinator.

Finally, the PhD Council will confirm the authorization at the next meeting. Maximum allowed: 60h per year.

For “informal” tutoring activities (such as supervision of bachelor/master students and supervisor assistance in teaching activities), authorization is not required. These activities allow the PhD student to earn doctoral credits (up to a maximum of 1.6 CD; see Section 3). Maximum allowed: 40h per year.

- **Remunerated activities compatible with PhD course**

Please check the website at the link below for compatibility of external activities with the PhD course:

<https://www.unibo.it/en/study/phd-professional-masters-specialisation-schools-and-other-programmes/phd/you-are-attending-a-phd-programme/compatibility-incompatibility-and-non-accumulation-regime-for-phd-programmes>

Send an email to the coordinator (Cristina Puzzarini) and the deputy (Damiano Genovese), putting in cc the PhD supervisor, asking for authorization and including (1) a letter of the supervisor that states on the compatibility of the activity with the PhD career and (2) all information reported in the table below. The coordinator will provide you with the authorization which will be formally approved by the next available “Collegio dei Docenti” (PhD council).

PhD Student and Cycle of PhD	Supervisor	Host structure where activity is performed	Description of research activity	Address, City, State	Period (start-end)	N° hours
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## SECTION 3 - Doctoral credits: what they are and how they work

**Doctoral Credits (CDs)** measure the workload of the PhD student in *research activities, research training, and teaching*, the three necessary tasks to obtain the doctoral degree. **The PhD student must earn 60 CDs per year**, corresponding to 1,500 hours of activity; each CD represents 25 hours of commitment from the PhD student. **As seen in Table A, for the PhD in Chemistry, it is requested to complete 20% of training and teaching activities and 80% of research activities.**

**Table A - Distribution of CDs between research, research training, and teaching:**

- Research activities: 144 CDs (80%)
- Research training + teaching activities: 36 CDs (20%)

The PhD in Chemistry has established the minimum number of CDs to be earned (see Table B) for each of the following activities: a) disciplinary and multidisciplinary training, b) training in the acquisition of transferable skills, c) extracurricular training, d) dissemination, e) teaching delivery.

The activities under points a) and b) constitute the so-called **curricular training**. This training is organized by the PhD Program in Chemistry, the participating departments, or the university. Curricular activities may be derived from similar offerings already available within the university's portfolio of Bachelor's and Master's degree programs. Specific curricular activities tailored for the PhD are designed to differ from undergraduate and Master's level teaching.

**Table B - Minimum number of CDs required for each type of activity:**

- Disciplinary and multidisciplinary training (DMT): 8 CD
- Transferable (or "soft") skills: 2 CD
- Extracurricular training: 1 CD
- Dissemination: 3 CD
- Teaching delivery and tutoring: 0 CD

**For "Teaching delivery and tutoring", there is a maximum of 1.6 CDs per year for those CDs earned by non-remunerated activities. For the other activities, there is not a maximum number of CDs.**

The PhD in Chemistry also sets the recommended number of CDs to be acquired for training and teaching each year (see Table C), to ensure a balanced approach between these activities and research. A PhD student in deficit of CDs in relation to the annual expected total will carry over the deficit to the following year.

**Table C - Recommended CD for research training and teaching to be earned during each year of the course:**

- End of Year 1: 15 CD

- End of Year 2: 30 CD
- End of Year 3: 36 CD

The number of CDs assigned to curricular training activities is calculated by summing lecture hours with the expected commitment for independent study. The PhD Program in Chemistry establishes its own general criteria (see Table D) to determine the number of CDs to be attributed for extracurricular training and dissemination activities. For teaching and tutoring activities, the number of hours specified in the corresponding contract/record is multiplied by a factor that accounts for the preparation time.

If the activity (whether at the University of Bologna or elsewhere) involves the formal granting of a certain number of ECTS credits, 1 ECTS credit corresponds to the acquisition of 1 CD.

**Table D - Correspondence between hours of engagement and acquired CD:**

Activity Type	Classroom Hours	Independent Hours	Study Total Hours	CD
Courses (disciplinary and multidisciplinary teaching)	6	19	25	1
Courses for transferable skills	6	19	25	1
Laboratory courses	6	19	25	1
Seminars with independent work	15	10	25	1
Seminars with mere attendance	25	0	25	1
Teaching (tutoring)	6	19	25	1
Extracurricular training	1 day (10 hours)	0	10	0.4
Dissemination	1 day (10 hours)	0	10	0.4

PhD students, in agreement with their supervisors and co-supervisors, define their specific research and training paths flexibly, selecting the activities to be performed in terms of type and quantity, in compliance with the constraints established by the PhD Council (Collegio dei Docenti) for each activity and year of the course. PhD students can earn CDs for activities carried out both at the University of Bologna and elsewhere. Periods spent at institutions other than Unibo lead to the acquisition of CDs based on the type of activity performed (research, disciplinary training, transferable skills training, etc.).

The verification process for CD acquisition takes place during the transition to the next year. PhD students who, at the end of their doctoral program, have acquired more CDs for training and teaching than those indicated in Table A will have these excess CD recognized beyond the theoretical total of 180. The PhD Council may require individual PhD students to acquire additional CDs if these credits are necessary to complete their preparation in fields essential to their research projects.

The allocation of CDs for research activities is based on an assessment of the research conducted and the results achieved (particularly the research outputs included in the University's Catalog of

Publications), taking into account the supervisor's and co-supervisor's opinions. CDs for research activities are formally assigned at the time of admission to the final exam.

PhD students can find a dedicated web page on doctoral credit on the PhD in Chemistry website: <https://phd.unibo.it/chimica/en/teaching>

## WHAT ARE RESEARCH ACTIVITIES?

The research activities for a student enrolled in the PhD Program in Chemistry at the University of Bologna lead to a rich and multifaceted journey aimed at developing both technical skills and the researcher's capacity for autonomy and innovation.

This process unfolds through various phases and tools that contribute to the personal, scientific, and professional growth of the PhD student.

1) Definition of the Research Project: At the beginning of the program, the PhD student, in collaboration with their supervisor, identifies an innovative and relevant research topic in the field of chemistry. This project is almost always linked to ongoing research lines within the research group, often funded by public or private entities.

2) Technical and Theoretical Training: The PhD student participates in advanced courses, seminars, workshops, summer schools, and conferences, both national and international – all activities that are part of the recognized academic credits for the PhD student – to deepen the specific knowledge required for their project. This continuous training allows the acquisition of state-of-the-art skills in international research.

3) Experimentation and Data Collection: A significant part of the PhD student's work is conducted in the laboratory, where experiments are performed, data are collected, and results are analyzed. This phase requires scientific rigor and problem-solving skills to overcome technical difficulties, competencies that are part of the PhD student's training. Data Analysis and Interpretation: The obtained results are analyzed using statistical and computational methods. The PhD student must develop critical skills to interpret the data meaningfully and draw valid conclusions. Growth and Autonomy: The growth and autonomy of the PhD student are stimulated through various tools and activities: Mentorship and Supervision: The supervisor's role is crucial in guiding the PhD student, providing continuous feedback and technical support. Over time, the PhD student gains greater independence in conducting research.

4) Participation in Scientific Community Events. Conferences and Symposia: Presenting their results in international contexts allows the PhD student to engage with field experts, receive feedback, and establish collaborations. Workshops and Summer Schools: These events offer intensive training opportunities on specific topics and promote interaction with other researchers. Interdisciplinary Collaborations: Working with other research groups, even from different disciplinary fields, enriches the knowledge base and stimulates innovation. This context also includes a required period at a foreign research institution within the three-year program. Expected 5) Outcomes and Products. The main outcomes and products expected from a PhD student's activities include: PhD Thesis: A comprehensive document detailing the research project, methods used, results obtained, and conclusions drawn. Scientific Articles: Publication of results in peer-reviewed journals, contributing to the advancement of knowledge in the field of chemistry. Patents: In the case of applied research, the PhD student may contribute to the development of new prototypes or patentable technologies; this type of product is considered of primary importance within this doctoral program. Creation of Spin-off Companies: In certain cases, when prospects related to the exploitation of intellectual property suggest it, the PhD student may participate in the creation of spin-off companies. Intellectual Property Protection Intellectual property protection, as mentioned earlier, is a crucial aspect of the PhD student's research work in Chemistry, which is the reason why a mandatory

training course on this subject is provided. The University of Bologna provides legal and administrative support for managing intellectual property, both through patent filing and drafting confidentiality agreements with industrial partners to protect sensitive information.

In conclusion, the research activities of a PhD student in Chemistry at the University of Bologna are a rich and articulated journey that fosters scientific and personal growth, stimulates autonomy, and contributes to the advancement of knowledge in the field, with the support of an international scientific community and effective tools for intellectual property protection.

## TRAINING AND COURSES

The student enrolled in the PhD program in Chemistry at the University of Bologna will undergo a research training during their three-year journey, comprising various essential parts for their academic and professional development. This training program is structured to provide comprehensive and in-depth preparation, enabling the doctoral student to acquire the necessary skills to become an autonomous and highly qualified researcher.

1) Training activities offered by the PhD program in Chemistry (or other related doctoral programs): These activities are essential to ensure a solid theoretical and practical foundation. The courses offered by the PhD program in Chemistry are divided into different categories to cover all the main areas of chemistry. The specific courses are dedicated to the main scientific sectors of interest, such as Analytical Chemistry, Physical Chemistry, Inorganic Chemistry, and Organic Chemistry. These courses allow students to deepen their knowledge in their respective fields of specialization. In addition to specific courses, soft skills courses are also offered, including an in-depth pathway for intellectual property management and the creation of spin-off companies, as well as topics such as scientific communication and current trends in the field of chemistry, to prepare students to effectively communicate their research results to a broader audience. Furthermore, courses aimed at greater awareness and competent use of the shared instrumentation available in the departments affiliated with the PhD program in Chemistry are proposed. These courses are fundamental to ensure that students can make the best use of the available technical and instrumental resources, thus improving the quality of their research.

2) Participation in training activities promoted by the University or other research entities in the Bologna area: In addition to the specific activities of the doctoral program, students are encouraged to participate in further training opportunities offered by the University of Bologna and other research entities in the Bologna area. These activities may include courses, workshops, conferences, and seminars covering a wide range of scientific and interdisciplinary topics. Participation in these activities allows students to broaden their knowledge, connect with other researchers and professionals in the field, and stay updated on the latest scientific and technological developments.

Participation in seminars or seminar cycles promoted by the PhD program in Chemistry, the departments affiliated with the PhD program, or other university structures: Participation in seminars is a crucial aspect of doctoral training. Seminars offer a unique opportunity to listen to and interact with experts in the field, both national and international, who present their latest research and discuss emerging trends in the field of chemistry. These events can include presentations of research results, discussions on innovative methodologies, and debates on current issues concerning the scientific community. Attending seminars and seminar cycles allows students to confront different perspectives, stimulate critical thinking, and develop new ideas for their research. Additionally, seminars foster the creation of a professional network that can be valuable for the future career development of doctoral students.

## SECTION 4 – COURSES offered by the PhD school in Chemistry

The courses offered by the PhD school of Chemistry for 2026 (period March-September, calendar to be announced) are the following:

<b>Type of course</b> (*DMT = Disciplinary and multidisciplinary training)	<b>Title (teacher)</b>	<b>Crediti Dottorali CD (hours)</b>
ANALYTICAL CHEMISTRY (DMT)	Analytical approaches for nanorisk assessment in environment/pharma/food (Andrea Zattoni);	1 (6h)
ANALYTICAL CHEMISTRY (DMT)	Analytical approaches for diagnostics and precision medicine (Jessica Fiori)	1 (6h)
ANALYTICAL CHEMISTRY (DMT)	Monitoring applications: Wearable sensors for monitoring vital parameters (Erika Scavetta)	1 (6h)
ANALYTICAL CHEMISTRY (DMT)	Monitoring applications: X-ray monitoring in material science and in the environment (Marco Giorgetti)	1 (6h)
PHYSICAL CHEMISTRY (DMT)	Modeling charge and energy transfer processes in organic materials and biosystems: theory and hands-on tutorial (Daniele Fazzi)	1 (6h)
PHYSICAL CHEMISTRY (DMT)	Advanced Spectroscopy: Near infrared spectroscopy, FT-IR and Raman spectroscopy (Assimo Maris).	1 (6h)
PHYSICAL CHEMISTRY (DMT)	Spectroscopic techniques and molecular simulations to explore the properties of organic functional materials (Elisabetta Venuti).	1 (6h)
PHYSICAL CHEMISTRY (DMT)	Electrochemical properties and characterisation of organic semiconductor materials and devices with Lab tutorial (Massimo Marcaccio).	1 (6h)
ORGANIC CHEMISTRY (DMT)	Laboratory of spectroscopy in organic chemistry: Hands on NMR (Andrea Mazzanti)	1 (6h)
ORGANIC CHEMISTRY (DMT)	Laboratory of spectroscopy in organic chemistry: Chiroptical methods (Michele Mancinelli).	1 (6h)
ORGANIC CHEMISTRY (DMT)	Advanced organic chemistry: Exercises in organic total synthesis” (Marco Lombardo);	1 (6h)
ORGANIC CHEMISTRY (DMT)	Advanced organic chemistry: Radicals in organic chemistry (Marco Lucarini).	1 (6h)
INORGANIC CHEMISTRY (DMT)	Molecular devices and machines: fundamentals and prospective applications. (Stefano Corrà)	1 (6h)
INORGANIC CHEMISTRY (DMT)	Homogeneous approaches to modern catalysis: sustainability and industrialization. (Massimiliano Curcio)	1 (6h)
INORGANIC CHEMISTRY (DMT)	Inorganic and hybrid nanomaterials (Enrico Rampazzo)	1 (6h)
INORGANIC CHEMISTRY (DMT)	Inorganic surface chemistry and coatings (Elisa Boanini)	1 (6h)
TRANSFERRABLE (SOFT) SKILLS	How the scientific method drives our research: critical reading and debate on selected scientific papers (Marianna Marchini).	1 (6h)
TRANSFERRABLE (SOFT) SKILLS	Discovery or Invention? The paradox for a researcher-inventor. Patenting, Licensing and IP in University: basics and examples. Business development in the chemical industry (Pierluigi Reschiglian)	2 (12h)
TRANSFERRABLE (SOFT) SKILLS	Academic spinoffs: from research to enterprise. The business model definition. Entrepreneurship on an academic basis.	2 (12h)



	Industrial Research and Innovation from an EU perspective: Horizon Europe Financing. (Pierluigi Reschiglian)	
SCIENCE AND SOCIETY (DMT)	Chemical and Biological warfare agents, disarmament and non-proliferation. (Emilio Parisini) The course covers the main scientific and technological aspects related to chemical and biological weapons, the use of chemical and biological weapons in history and the main international treaties that prevent their development and proliferation. The course is designed for chemistry and biology students but also for students with a basic scientific background. Although some chemical and biological competences are useful, the course can be followed with profit also by students with a background in social sciences and international relations.	2 (12h)
SUSTAINABLE CHEMISTRY (DMT)	Advanced inorganic materials for batteries (Francesca Soavi) Environmental and safety issues of advanced batteries (Catia Arbizzani)	2 (12h)
SUSTAINABLE CHEMISTRY (DMT)	Photoreactivity and Photocatalysis: excited states (Andrea Fermi) Photoreactivity and Photocatalysis: applications and mechanisms (Andrea Gualandi)	2 (12h)
SHARED INSTRUMENTATION (DMT)	Introduction and initial training on Fluorescence Confocal Microscopy, FLIM and FCS: principles and applications to (nano)materials (Damiano Genovese)	1 (6h)
SHARED INSTRUMENTATION (DMT)	Introduction and initial training on Single Crystal Diffraction. (Simone d'Agostino)	1 (6h)
NANOTECHNOLOGY (DMT)	Nanoelectronics, Nanosensors and Nanodevices (Sabrina Conoci)	2 (12h)
Activity of dissemination	“Conoscere la Chimica” is a practical activity on the popularization of science. The group is usually involved in the event “La notte dei Ricercatori” and it organizes four shows for the school (students aged 9-13). The PhD students will be involved in the planning and realization of the events, and will experience teamwork, and how to cope with unexpected situations. “ChimicAmica” is another new dissemination activity to bring science in unconventional environments. (Lucia Maini, Giovanni Valenti, Mattia Melosso)	(Every 25h = 1 CD)

## GENERAL RULES

- 1) PhD candidates must attend, during the three years, at least 8 (and up to 32) CDs of classes.
- 2) Teaching is normally in presence, unless otherwise noted; presence is always mandatory when classes comprise a practical part in the laboratory (explicitly noted).
- 3) On-line participation to classes is permitted upon request (via email to the teacher, putting in cc to the vice-coordinator Damiano Genovese) only in the following cases, and it always requires keeping the camera *ON* during classes:
  - for off-campus (always);
  - for those temporarily off-site (if authorized to travel by the coordinator);
  - for health reasons (duly documented).

- We recall that, since the 8 (at least) CDs must be attended by the end of the three years, if one is temporarily off-site (e.g., abroad or at a conference), then he/she can also attend next year.

4) The course is considered valid if the student has attended at least 5 of the 6 scheduled hours (there is no difference between presence and online) and if the students pass the short examination proposed by the teacher at the end of the course.