

## **Agreement of objectives during the research stage of the Ph.D. program**

### **Explanations**

#### **Intention of the agreement**

The agreement of objectives marks the obligatory elements of the research stage of the Ph.D. program in chemistry according to § 9 para. 3 of the study regulations. It provides an opportunity for Ph.D. students to select the elements of the course work, which are necessary and obligatory prerequisites for the doctoral examination. This selection should be done in advance, together with and in agreement with the Ph.D. supervisor, the second reviewer and the examiners of the subsidiary subjects.

The agreement serves, at the same time, as the form on which the people in charge of a particular element can confirm the participation in an event or the submission of deliverables. The completed form can be submitted at the examination office upon registration for the Ph.D. defence, making further certificates and written confirmations obsolete.

#### **Annotations to the elements**

##### 1. Interdisciplinary lecture program

Ph.D. students should expose themselves to current scientific questions in chemistry beyond their own field of research. This requirement can be met by regular attendance of the GDCh (Gesellschaft Deutscher Chemiker, Ortsverband Darmstadt) colloquium. For Ph.D. students with a non-chemical background (e.g. master in biology or physics) this may be substituted by participation in similar general lecture series in the corresponding department (e.g. colloquia in the biology or physics department). For interdisciplinarity, switching between different colloquia is encouraged. Externally working Ph.D. students can replace this course by locally available courses of equivalent duration in consultation with their Ph.D. supervisor.

##### 2. Subject-specific lecture program

The regular participation in the subject-specific colloquium of the appropriate institute is expected, e.g. the Eduard-Zintl-colloquium for Ph.D. students in the field of physical chemistry. These courses can be substituted by others which are equivalent in volume in consultation with the Ph.D. supervisor.

##### 3. Seminar on literature and methods I

Ph.D. students are expected to take part actively in the seminar of their group. Usually these seminars are a mixture of progress reports and discussions, respectively, critical reflection of current literature. At least four contributions to the seminar (i.e. group talks) are expected within four semesters.

#### 4. Seminar on literature and methods II

Ph.D. students should have the opportunity to deal with current themes and questions in varying fields of research in chemistry and related sciences beside their own field of research. This will be done by visiting the seminar of another group, for example that of the group of the intended second reviewer or one of the examiners in subsidiary subjects. Switching between several groups is explicitly encouraged. (The volume has to be at least 1 SWS. This means a weekly seminar of 90 minutes has to be attended at least biweekly.) Consultation of the Ph.D. supervisor concerning the choice of the group is recommended. NB: The participation in a particular group seminar does not automatically entail the choice of the professor in charge as second reviewer or examiner. The second reviewer and the examiners in the subsidiary subjects are chosen at the end of the research phase upon submitting the application for the doctoral examination.

#### 5. Research-seminar of the Ph.D. students

The research-seminar of the Ph.D. students (Doktorandentag) is an event of the department of chemistry, which takes place twice a year: in the penultimate week of the summer term and in the last week before Christmas. These events offer an opportunity for the the Ph.D. students to present their research to the department of chemistry by a talk in one semester and by a poster (or a second talk) in another semester. At least 50 % of the scientific content of the talk should be results from the Ph.D. student's own research. The purpose of this event is to inform the department of chemistry about the progress of its Ph.D. students. Therefore this event cannot be replaced by an external one.

#### 6. Workshop or symposium presentation

Every Ph.D. student has to present at least once his/her research by a presentation or a poster at an external workshop or symposium. This can be a workshop for Ph.D. students in a special research field (SFB) or a special program (Forschungsschwerpunkt) of the DFG as well as a national or international symposium which is related to the field of research of the Ph.D. student.

#### 7. Interdisciplinary training

Every kind of training can be accepted which supports direct or indirect vocational qualification, e.g. Laser safety course, first-aid course, courses on sustainability and green chemistry, environmental protection in the field of chemistry, removal of chemical waste, course on directions on hazardous materials or transportation and handling of hazardous materials, training about the law concerning genetic engineering, language courses focused on technical application and others.

## 8. Project planning

At the end of the first year at the latest, the Ph.D. student has to give a written interim report to the Ph.D. supervisor. This should show what would have been investigated up to the point in time and how the research will proceed until the completion of the Ph.D. (work plan), the methods that are going to be applied, the (technical) problems that need to be overcome for completion, and the expected results. This report can be written as a grant proposal (an application for a research project with a funding agency). Form, length and composition of the interim report are arranged with the Ph.D. supervisor directly. The Ph.D. supervisor certifies the interim report. The report does not need to be published.

## 9. Scientific guidance

The Ph.D. student should gain experience in knowledge transfer and teaching by supervising practicals, seminars or exercises. The absolute minimum is three SWS, so in total at least 45 hours. This duty has to be fulfilled by external Ph.D. students as well by taking teaching duties in the department of chemistry at the TUD, for example in appropriate block courses. Any substitution by courses taught at other institutions than the department of chemistry must be approved by the examination board in advance.

## 10. Courses in subsidiary subjects

The Ph.D. student should acquire enough knowledge to conduct a scientific discussion during the doctoral examination both in his/her field of study as well as other fields. Therefore, courses in at least one subsidiary subject have to be chosen in agreement with the examiner of the subsidiary subjects (in total four SWS). Usually two subsidiary subjects are taken (so 2 x 2 SWS). Besides taking a course (which must not have been already been taken at the M.Sc. phase), this training in the subsidiary subject can also be accomplished by studying reviews and articles from literature of a selected topic suggested by the examiner of the subsidiary subject. The topic can be but need not be related to the Ph.D. thesis.