

# METHODOLOGICAL GUIDELINES FOR THE ACADEMIC DOCTORAL STUDY PROGRAM “CHEMISTRY, MATERIALS SCIENCE AND ENGINEERING”

*Adopted according to RTU Senate Resolution (dated 26 June 2012, Minutes No. 561) and amendments to that (dated 25 March 2013, Minutes No. 568 and 27 September 2016, Minutes No. 602) “On Doctoral Study Regulation at Riga Technical University”*

## 1. General Concept

The academic PhD study program “Chemistry, Materials Science and Engineering” is an interdisciplinary study program that provides an opportunity to obtain knowledge, skills, and competencies for performing scientific research in chemistry, chemical technology, materials science, and physics, as well as related industries.

**2. The Advisory Council (AC)** is a collegial, consultative, and coordinating institution that aims to promote a high-quality doctoral study process and scientifically significant PhD theses. Upon receipt of the admission documents, the director of the study program determines the composition of the advisory committee (AC) for each PhD student individually, which is further approved by the faculty's Scientific Committee (SC).

AC includes:

- Scientific supervisor/s;
- Director of the study program or an expert appointed by the director;
- Expert in the scientific field with a PhD degree (or its equivalent), not representing the RTU structural unit of the Ph.D. student. Such an expert can also be a representative of RTU cooperation partners;
- Head of the structural unit of the PhD student.

AC issues recommendations to the PhD student regarding the development of the PhD Thesis and publication of scientific articles and evaluates the progress of the PhD Thesis and its readiness for public defence.

## 3. Content of the Study Program

During the compulsory (A) part of the study program in the amount of 20 credit points (30 ECTS), the PhD student shall undertake three study courses – “Scientific Seminars”, “Academic Writing”, and “Original Research Article”, which develop:

- Skills to analyse and perceive the most important results of contemporary scientific research, their nuances, and further research opportunities (the study course “Scientific Seminars”);
- Skills in creating the style and content of a scientific publication (the study course “Academic Writing”);
- Skills to summarize, interpret, assess, and describe the results obtained during the individual research in the form of a publication and to understand the nuances of the publication submission and acceptance procedure (the study course “Original Research Article”).

The free elective part (C) of the study program consists of 18 credit points (27 ECTS). The PhD students, by cooperating with their Advisory Council, should select PhD level courses of a minimum of 10 credit points (15 ECTS) that extend their knowledge, skills, and competencies in the topics related to the subject of the PhD Thesis.

One hundred fifty-four credit points (231 ECTS) are allocated to implement the research work.

## 4. Commencing Studies

Following the submission of the PhD student admission documents to the RTU Doctoral Studies Department, the Faculty of Materials Science and Applied Chemistry (FMSAC) Scientific

Committee takes a decision regarding the support of the PhD student admission, approves the personalized AC composition and the field of science of the research work.

The PhD student shall coordinate the provisional list of free elective study courses (Part C) with the AC for the entire study period within a week after matriculation. The list may be amended at the start of each academic year when agreed upon with the AC. During the entire study period, the PhD student shall acquire free elective doctoral-level courses (Part C) in the volume of at least 9 CP (13.5 ECTS).

## **5. Study process**

The study course “Scientific Seminars” is held thematically for a group of at least five PhD students. The number of PhD students in the group who must receive an assessment in the study course “Scientific Seminars” may be less than five if PhD students from other study years participate in the classes voluntarily with their presentations. If such a PhD student group cannot be organized within a structural unit, several structural units shall unite to implement the study course “Scientific Seminars”. This course should have a minimum of 12 on-site or online classes each semester. Apart from the PhD students involved in this study course, representatives of the structural units and/or field experts with a scientific degree from other scientific institutions shall be invited for the seminars, thus forming an entire valuable audience for holding substantial discussions.

The PhD student shall inform the AC of the progress in studies and scientific research until the 18<sup>th</sup> week of each semester. Based on this information, AC decides on the assessment received by the student within the study course “Scientific Work”. The assessment is entered into the RTU Study Management System by the head of the structural unit.

The PhD student can pass a credit test for the study course “Original Research Article” as soon as a confirmation is received from the editorial board that the article is entirely accepted for publication.

Compulsory (Part A) and free elective (Part C) doctoral study course examinations are recorded following the RTU Regulation on Doctoral Studies.

## **6. Types of PhD Thesis and the Requirements**

### **6.1. PhD Thesis in the form of a dissertation.**

The PhD Thesis shall summarize available information on the research, and the proposed way for the scientific problem solution and shall demonstrate in brief the originality of the author’s scientific thinking, the accuracy, and constructivism of the scientific problem solution, confirming it with analytical, numerical or graphic models, statistical indicators, own experimental research results, conclusions, and proposals. Following the “Guidelines for Development of the PhD Theses and its Summary at RTU”, the Summary of the PhD Thesis shall be developed in Latvian and English.

Results described in the PhD Thesis shall be published or accepted for publication in the volume that corresponds to one of the following options:

- A. At least three articles in Scopus and/or Web of Science indexed scientific journals, one of which can be a review article, and the others are original articles (journal articles); for at least one article, the doctoral candidate is the first author.
- B. At least two articles in Scopus and/or Web of Science indexed scientific journals and one publication in a Scopus and/or Web of Science indexed edition of conference proceedings, one of which can be a review article, and the others are original articles (journal article); for at least one article, the doctoral candidate is the first author.

The Scientific Committee of the Faculty may decide on equalling a patent application (A) issued by the European Patent Office (EPO), the World Intellectual Property Organization (WIPO), or patent institutions of the USA or Japan to a scientific article.

All of the publications above shall be submitted to the journal's editorial board after receiving the Master’s Diploma.

### **6.2. PhD Thesis by compilation of thematically unified scientific publications (PhD Thesis by Publication).**

The PhD Thesis by Publication consists of the Summary in Latvian and English and the author’s articles published in the scientific journals indexed in Scopus and/or Web of Science, which provide a

uniform insight into the main results of the research. To qualify for the PhD Thesis by Publication, the following four criteria shall be fulfilled:

- I. At least four articles are published or accepted for publication, of which one can be a review, while others are journal articles. All articles are indexed in Scopus and/or Web of Science databases.
- II. The PhD candidate is the first author of a minimum of two articles.
- III. At least one article is included in the Q1 category journal according to Scopus and/or Web of Science databases.
- IV. Bibliographic indicators of the journals where articles are published comply with one of the following options (in the priority sequence):
  - i. The sum of the journal impact factors of the journal publishing year is at least 10, according to the Web of Science data;
  - ii. The sum of *CiteScore* indexes of the journal publishing year is at least 16, according to the Scopus data.
- V. PhD Thesis by Publication may include only those articles which have been submitted to the editorial board of the journal after receiving the Master's Diploma.

The volume of the Summary of the PhD Thesis by Publication is a minimum of 30 pages. It shall contain the following parts:

- I. General characteristics of the PhD research:
  - i. Topicality of the research;
  - ii. Goal and objectives of the research;
  - iii. Scientific novelty and main results;
  - iv. Structure and volume;
  - v. Research approbation and publications (list).
- II. Main results of the PhD research (including a brief literature review).
- III. Conclusions.
- IV. List of references.

Approved at the Study Field Committee "Chemistry, Chemical Technologies and Biotechnology" meeting on 6 October 2023 and the Study Field Committee "Physics, Materials Science, Mathematics and Statistics" on 13 October 2023.

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