**Federal State Autonomous Educational Institution for Higher Education**
**PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA named after P. Lumumba**
**(RUDN University)**

**Science faculty**

educational division (faculty/institute/academy) as higher education programme developer

# COURSE SYLLABUS

## «The method of working with databases»

course title

**Recommended by the Didactic Council for the Education Field of:**

04.04.01 «Chemistry»

field of studies / speciality code and title

**The course instruction is implemented within the professional education programme of higher education:**

«Fundamental and applied chemistry»

higher education programme profile/specialisation title

**2023**

## 1. COURSE GOAL(s)

The goal of the course of "Methods of working with databases" is to assist students in obtaining the necessary information from available databases on the Internet.

## 2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline (module) "Methods of working with databases" expects students to acquire the following competences /competences in part.

*Table 2.1. List of competences that students acquire through the course study*

| Competence code | Competence descriptor | Competence formation indicators (within this course) |
|---|---|---|
| GC-7 | The ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the received information to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data | GC-7.1. Uses digital technologies and methods for searching, processing, analyzing, storing and presenting information in the field of chemistry. |
| | | GC-7.2. Develops the concept of digital technologies and methods for searching, processing, analyzing, storing and presenting information within the framework of the designated problem formulates the goal, objectives, justifies the relevance, significance, expected results and possible areas of their application in the digital economy and modern corporate information culture. |
| | | GC-7.3. Monitors the use of digital technologies and methods for searching, processing, analyzing, storing and presenting information in the field of chemistry, corrects deviations, and makes additional changes to the plan for using digital technologies. |
| M-PC-2-s | Ability to conduct patent information research in the chosen field of chemistry and/or related sciences | M-PC-2-s-1. Searches for specialized information in patent information databases |
| | | MSPC-2-s-2. Analyzes and summarizes the results of a patent search on the subject of the project in the selected field of chemistry (chemical technology) |

## 3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the elective component of (B1) block of the higher educational programme curriculum.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

*Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results*

| Competence code | Competence descriptor | Previous courses/modules* | Subsequent courses/modules* |
|---|---|---|---|
| GC-7 | The ability to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the received information to solve problems; evaluate information, its reliability, build logical conclusions based on incoming information and data | | Actual problems of modern chemistry<br>Research work<br>Undergraduate practice |
| M-PC-2-s | Ability to conduct patent information research in the chosen field of chemistry and/or related sciences | | Domino reactions in the synthesis of heterocycles<br>NMR of organic compounds<br>Molecular spectral analysis<br>Chemistry of natural compounds<br>Chemistry of heterocyclic compounds<br>Mass spectrometry of organic compounds<br>Stereochemistry<br>Fundamentals of drug design<br>Experimental methods in the chemistry<br>Research work<br>Undergraduate practice |

* To be filled in according to the competence matrix of the higher education programme.

## 4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course is 2 credits.

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (full-time training)\**

| Types of academic activities | Total academic hours | Semester(-s) | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| *Contact work, ac.h.* | 36 | 36 | | | |
| including: | | | | | |
| Lectures (**LC**) | 18 | 18 | | | |
| Lab Works (**LW**) | 18 | 18 | | | |
| Seminars (workshops/tutorials) (S) | | | | | |
| *Self-studies* | 18 | 18 | | | |
| *Evaluation and assessment (exam/passing/failing grade)* | *18* | *18* | | | |
| **Course workload** — academic hours_ | **72** | **72** | | | |
| **Course workload** — credits | **2** | **2** | | | |

* To be filled in regarding the higher education programme correspondence training mode.

## 5. COURSE CONTENTS

*Table 5.1. Course contents and academic activities types*

| Course module title | Course module contents (topics) | Academic activities types* |
|---|---|---|
| Section 1. "Classical" sources of chemical information - abstract journals RZh Chem., Chemical Abstracts, Beilshtein. | Theme 1.1. Acquaintance of students with the main sources of searching for chemical information in the submitted abstract journals, methods of searching for information of interest, the possibilities of presenting and searching for chemical information on the Internet. | LC, LW |
| | Theme 1.2. Opportunities provided by the electronic version of Chemical Abstracts. | LC, LW |
| Section 2. Search for the necessary synthetic methods on the orgsyn server | Theme 2.1. Acquaintance of students with other electronic free sources of scientific information. | LC, LW |
| | Theme 2.2. Work with the server http://www.orgsyn.org/ and the possibility of searching for methods for the synthesis of compounds of interest. | LC, LW |
| Section 3. Free electronic versions of organic chemistry journals. | Theme 3.1. Work with full-text free electronic journals on the net, features of searching for articles of interest in this publication. | LC, LW |
| | Theme 3.2. Work with full-text journals of the American Chemical Society. | LC, LW |
| | Theme 3.3. Ways to search for information on the ACS website. | LC, LW |
| Section 4. Patent information | Theme 4.1. Search for patents on the USPTO website | LW |
| | Theme 4.2. Search for patents on the website of the European Patent Office | LW |
| Section 5. Search capabilities for chemical information provided by paid services | Theme 5.1. Sci-Finder | LC, LW |
| | Theme 5.2. Reaxys | LC, LW |

| Course module title | Course module contents (topics) | Academic activities types* |
|---|---|---|
| Section 6. SCOPUS searching system. | Theme 6.1. Work in the SCOPUS search engine | LC, LW |

\* - to be filled in only for **full** -time training: *LC - lectures; LW - lab work; S - seminars.*

## 6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

*Table 6.1. Classroom equipment and technology support requirements*

| Type of academic activities | Classroom equipment | Specialised educational / laboratory equipment, software, and materials for course study (if necessary) |
|---|---|---|
| Lecture | A lecture hall for lecture-type classes, equipped with a set of specialised furniture; board (screen) and technical means of multimedia presentations. | |
| Computer Lab | A classroom for conducting classes, group and individual consultations, current and mid-term assessment, equipped with personal computers (in the amount of 12 pcs), a board (screen) and technical means of multimedia presentations. | List of specialised software installed on computers for mastering the discipline |
| Self-studies | A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment. | |

## 7. RESOURCES RECOMMENDED FOR COURSE STUDY

*Main readings:*
1. Electronic database REAXYS https://www.reaxys.com
2. Abstract database SCOPUS http://www.elsevierscience.ru/products/scopus/
3. Patent database USPTO https://patft.uspto.gov/netahtml/PTO/search-bool.html
4. Electronic database Sci-Finder-n https://sso.cas.org/

*Additional readings:*

1. Website of the American Chemical Society ACS Publications: Chemistry journals, books, and references https://pubs.acs.org/
2. Server with the ability to search for methods for synthesizing compounds http://www.orgsyn.org/

*Internet sources*

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:
- RUDN Electronic Library System  (RUDN ELS) http://lib.rudn.ru/MegaPro/Web
- EL  "University Library Online" http://www.biblioclub.ru
- EL "Yurayt" http://www.biblio-online.ru
- EL "Student Consultant" www.studentlibrary.ru
- EL "Lan" http://e.lanbook.com/
- EL "Trinity Bridge"

2.  Databases and search engines:
- electronic fund of legal and normative-technical documentation http://docs.cntd.ru/
- search engine Яндекс https://www.yandex.ru/
- search engine Google https://www.google.ru/
- Scopus abstract database http://www.elsevierscience.ru/products/scopus/

*Training toolkit for self- studies to master the course \*:*
1. Course of lectures on the discipline «Methods of working with databases».
2. Guidelines for laboratory works
   \* - all educational and methodological materials for independent work of students are placed in accordance with the current procedure on the page of the discipline in **TUIS**!

## 8. ASSESSMENT TOOLKIT AND GRADING SYSTEM\* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system\* to evaluate the competences formation level (competences in part) upon the course study completion are specified in the Appendix to the course syllabus.
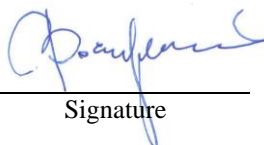
\* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

**DEVELOPERS:**

| **Head of the Department of** | | **L. G. Voskressensky** |
| **Organic Chemistry** | | |
| Position, Department | Signature | name and surname |

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 **Dean of Science faculty,**

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