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

**Science faculty**

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

**COURSE SYLLABUS**

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«The method of working with databases»

course title

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

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04.04.01 «Chemistry»

field of studies / speciality code and title

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

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«Fundamental and applied chemistry»

higher education programme profile/specialisation title

## 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.

## 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		Actual problems of modern chemistry Research work Undergraduate practice

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
	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		

\* 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		
	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,	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	LC, LW

Course module title	Course module contents (topics)	Academic activities types*
Beilshstein.	chemical information on the Internet.	
	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 <a href="http://www.orgsyn.org/">http://www.orgsyn.org/</a> 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
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

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
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](http://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!**

**DEVELOPERS:**

**Head of the Department of  
Organic Chemistry**

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Position, Department

**L. G. Voskressensky**

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Signature

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name and surname

**HEAD OF EDUCATIONAL DEPARTMENT:**

**Organic Chemistry Department**

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Name of Department

**L. G. Voskressensky**

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Signature

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name and surname

**HEAD  
OF HIGHER EDUCATION PROGRAMME:**

**Dean of Science faculty,**

**Head of the Department of**

**Organic Chemistry**

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Position, Department

**L. G. Voskressensky**

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Signature

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name and surname