Federal State Autonomous Educational establishment of higher education
RUDN-University

Engineering Academy

Recommended by ICSS

PROGRAMME STRUCTURE AND SYLLABUS OF SCIENTIFIC RESEARCH

Research type: Scientific Research Activities

Recommended for the program track: 09.06.01 Informatics and computer engineering

Educational program specialization: Management in social and economic systems (engineering science): strategic management

1. Course objectives and learning outcomes

Aim scientific research is the formation of the level of knowledge, skills and abilities of research activities necessary for the implementation of professional activities.

Tasks to be solved in the course of scientific research:

1) Choosing a topical research topic
2) Planning the stages of research, determining the necessary resources (material and intangible), the choice of tools and methods for each stage.
3) Conducting a critical analysis of literary sources (scientific information) on the topic of research.
4) Conducting scientific research and experiments.
5) Approbation of the obtained results.
6) Registration of research results in accordance with the established requirements for reporting documents.
7) Preparation of scientific articles, selection of optimal scientific publications to promote research results.
8) Mastering technologies for promoting the results of intellectual activity and models of commercialization of the results of intellectual activity.
9) Conducting scientific discussions, presentations and public protection of research results.

2. Place of the Scientific Research (SR) in the structure of General Education Programme

The SR belongs to the variable part of Block 3 of the curriculum. Table 1 shows the previous and subsequent components of the educational program aimed at the formation of competencies in accordance with the competence matrix of Education Programme of High Education Competence-based education.

Table No. 1

Preceding and subsequent courses, directed to the competences forming

№ п/п	Competence and its code	Preceding courses	Following courses
Universal competencies			
1	UC-1 UC -2 UC -3 UC -4 UC -5 UC -6	Research methodology Research Seminar Teaching Methodology for Informatics and Computer Engineering Management in social and economic systems Modern problems of the theory of management of social and economic systems System analysis, control and information processing Modeling social and economic systems History and philosophy of science Practice for obtaining professional skills and professional experience (research practice)	Scientific research (preparation of scientific qualification work (dissertation) for the degree of candidate of sciences (Ph.D.)
General professional competencies			
2	GPC-1 GPC -2 GPC -3 GPC -4 GPC -5 GPC -6 GPC -7	Research methodology Research Seminar Teaching Methodology for Informatics and Computer Engineering Management in social and economic systems Modern problems of the theory of management of social and economic systems System analysis, control and information processing Modeling social and economic systems History and philosophy of science Practice for obtaining professional skills and professional experience (research practice)	Scientific research (preparation of scientific qualification work (dissertation) for the degree of candidate of sciences (Ph.D.)
Professional competence			
3	PC-3 PC-4 PC-5	Research methodology Research Seminar Management in social and economic systems Modern problems of the theory of management of social and economic systems System analysis, control and information processing Modeling social and economic systems	Scientific research (preparation of scientific qualification work (dissertation) for the de-

		Practice for obtaining professional skills and professional experience (research practice)	gree of candi-date of sciences (Ph.D.)

3. Requirements to the outcome of the SR

The learning outcomes of the SR are special knowledge, abilities, relevant skills and experience, which will ensure the achievement of the planned results of mastering the educational program and will characterize the stages of the formation of the following competence:

–able to analyze critically and evaluate modern scientific achievements, generate new ideas when solving research and practical problems, including in interdisciplinary areas (UK-1);

–able to design and carry out complex research, including interdisciplinary, based on a holistic systemic scientific worldview using knowledge in the field of history and philosophy of science (UK-2);

–ready to participate in the work of Russian and international research teams to solve scientific and scientific and educational problems (UK-3);

–ready to use modern methods and technologies of scientific communication in the state and foreign languages, including the readiness to communicate in oral and written forms in Russian and foreign languages to solve pr`oblems of professional activity, possession of foreign language communicative competence in official business, educational professional, scientific, socio-cultural, everyday life spheres of foreign language communication (UK-4);

–able to follow ethical standards in professional activity (UK-5);

–able to plan and solve problems of one's own professional and personal development (UK-6)

–know the methodology of theoretical and experimental research in the field of professional activity (GPC-1);

–possess of the culture of scientific research, including the use of modern information and communication technologies (GPC-2);

– able to develop new research methods and their application in independent research activities in the field of professional activity (GPC-3);

–ready to organize the work of the research team in the field of professional activity (GPC-4);

–able to evaluate objectively the results of research and development carried out by other specialists and in other scientific institutions (GPC-5);

– the ability to present the results of research activities at a high level and taking into account the observance of copyright (GPC -6);

–get knowledge of methods of conducting patent research, licensing and copyright protection when creating innovative products in the field of professional activity (GPC-7);

–ready for independent (including leading) research activities, requiring broad fundamental training in modern areas of branch science, deep specialized training in the chosen direction, possession of the skills of modern research methods (PC-3);

–get fundamental knowledge in the main sections of computer science and computer technology, including the theoretical foundations of computer science, mathematical modeling, numerical methods and software packages, system analysis, information management and processing, elements and devices of computer technology and control systems, management in social and economic systems, use information retrieval systems, use experimental research techniques (PC-4).

–get fundamental knowledge in the main sections of informatics and computer technology, must have the ability to conduct scientific research and obtain new scientific and applied results (PC-5)

4. The scope of scientific research and types of educational work

General workload of the course is 129 credit units (4 644 academic hours)

academic hours

Form of study	Total hours								
	Semester								Total
	1	2	3	4	5	6	7	8	
Class hours (total)	32	22	20	28	36	36	-	-	174
Including:									
Lectures	-	-	-	-	-	-	-	-	-
Practical classes (PC)	32	22	20	28	36	36	-	-	174

Self-study	742	572	538	674	918	918	-	-	4 362
Assessment	18	18	18	18	18	18	-	-	108
Total hours:	792	612	576	720	972	972	-	-	4 644
credits:	22	17	16	20	27	27	-	-	129

5. Content of the course

5.1. Course Units

№ п/п	Name of the course part	Subject matter of the part
1	Identification Research topics SRW	Topic a 1.1. Identifying topics for SRW Topic 1.2. Compilation of a bibliography on the topic of research
2	Drawing up a plan for scientific research	Topic 2.1. Formulation of the relevance of goals, objectives, problem field of research Topic 2.2. Analysis of theoretical concepts on the problem under study and formulation of theoretical prerequisites, principles underlying the research
3	Development of research and development programs, organization of their implementation	Topic 3.1. Methodological principles of studying actual social and economic problems Topic 3.2. Organization and conduct of experiments, collection of empirical data and their interpretation
4	Development of models of processes, phenomena and objects, evaluation and interpretation of results	Topic 4.1. Adjustment (clarification) of the research program: clarification of the research problem (research question) and other elements of the methodological part of the research program Topic 4.2. Collection and processing of empirical material (for works containing empirical research)
5	Preparation of scientific publications	Topic 5.1. Discuss the logic and structure of data analysis. Possible options for processing primary information. Topic 5.2. Collection and processing of material for scientific publications. Topic 5.3. Writing scientific articles on the problem of research.
6	Preparation of reports and approbation of research results at scientific conferences and symposia	Topic 6.1. Modeling of methods and directions in the formulation of conclusions and recommendations. Topic 6.2. Implementation of research results.

5.2. Course Units and Academic Activities

academic hours

№ п/п	Subject matter of the part	Lectures	Seminars	Self-study	Assessment	Total workload, hours o
1	Choosing scientific research work (SRW) topic	-	16	796	18	828
2	Drawing up a plan for scientific research	-	11	590	18	612
3	Development of research and development programs, organization of their implementation	-	10	520	18	540
4	Development of models of processes, phenomena and objects, evaluation and interpretation of results	-	14	692	18	720
5	Preparation of scientific publications	-	18	936	18	972
6	Preparation of reports and approbation of research results at scientific conferences and symposia	-	18	936	18	972
	Total:	-	174	4362	108	4644

6. Seminars/practical classes

№ п/п	Course unit	Topics and issues for discussion	Total workload, hours
1	1	Topic 1.1. Definition of research topics Topic 1.2. Compilation of a bibliography on the topic of research (SRW)	16

2	2	Topic 2.1. Formulation of the relevance of goals, objectives, problem field Topic 2.2. Analysis of theoretical concepts on the problem under study and formulation of theoretical prerequisites, principles underlying the research	11
3	3	Topic 3.1. Methodological principles of studying actual social and economic problems Topic 3.2. Organization and conduct of experiments, collection of empirical data and their interpretation	10
4	4	Topic 4.1. Adjustment (clarification) of the research program: clarification of the research problem (research question) and other elements of the methodological part of the research program Topic 4.2. Collection and processing of empirical material (for works containing empirical research)	14
5	5	Topic 5.1. Discuss the logic and structure of data analysis. Possible options for processing primary information Topic 5.2. Collection and processing of material for scientific publications Topic 5.3. Writing scientific articles on the problem of research	18
6	6	Topic 6.1. Modeling of methods and directions in the formulation of conclusions and recommendations Topic 6.2. Implementation of research results	18

7. Technical Support

Classrooms with technical support	Address
Classroom for lectures, seminars and midterm assessments № 493 Projector Epson EH-TW5300 (LCD, 1080p 1920 x 1080, 2200Lm, 35000:1, 2 x HDMI, MHL Screen Draper Baronet NTSC (3:4) 244/96(8) 152*203 MW Set of specialized furniture	Moscow, Ordzhonikidze str., 3
Education and methodology Calassroom for self-study № 345 Equipment and furniture:: - personal computers with access to the Internet; - desks, chairs	Moscow, Ordzhonikidze str., 3

8. Study-methodical and information sources:

Databases, reference systems and search engines:

1. Electronic library system(ELS) РУДН and third-party ELS :
   - ELS RUDN http://lib.rudn.ru/MegaPro/Web
   - ELS «University Library Online» http://www.biblioclub.ru
   - ELS Юрайт http://www.biblio-online.ru
   - ELS «Student's consultant» www.studentlibrary.ru
   - ELS «Лань» http://e.lanbook.com/
2. Websites of ministries, departments, services, production enterprises and companies whose activities are specialized for the course:
   - http://economy.gov.ru/minec/main/- website of the Ministry of Economic Development of the Russian Federation
3. Databases and search engines:
   - electronic fund of legal and normative-technical documentation http://docs.cntd.ru/
   - Yandex search engine https://www.yandex.ru/
   - search engineGoogle https://www.google.ru/
   - abstract database SCOPUS http://www.elsevierscience.ru/products/scopus/

9. Educational methodology resources

Basic literature

1. Современный менеджмент. Учебник / Кафидов В.В., Сопилко Н.Ю. – М.: РУДН, 2018. – 380 с.

2. Мельников Роман Михайлович. Эконометрика [Электронный ресурс]: Учебное пособие / Р.М. Мельников. – Электронные текстовые данные. – М.: Проспект, 2017. – 282 с.

3. Эконометрика: учебник / К.В. Балдин, В.Н. Башлыков, Н.А. Брызгалов и др.; под ред.

В.Б. Уткина. - 2-е изд. - Москва: Издательско-торговая корпорация «Дашков и К°», 2017. – 562 с.: ил. - Библиогр.: с. 473-477. - ISBN 978-5-394-02145-9; То же [Электронный ресурс]. - URL: http://biblioclub.ru/index.php?page=book&id=452991 (17.01.2018).
4. Новиков А.И. Экономико-математические методы и модели: учебник / А.И. Новиков. - Москва: Издательско-торговая корпорация «Дашков и К°», 2017. - 532 с.: ил. - (Учебные издания для бакалавров). - Библиогр. в кн. - ISBN 978-5-394-02615-7; То же [Электронный ресурс]. - URL: http://biblioclub.ru/index.php?page=book&id=454090 (04.05.2019).
5. Матюшок В.М. Основы эконометрического моделирования с использованием Eviews: Учебное пособие / В. М. Матюшок, С.А. Балашова, И.В. Лазанюк. – 3-е изд., перераб. и доп. - М.: Изд-во РУДН, 2015. – 228 с.

Supplementary literature:

1. Теория систем и системный анализ: учебник / В.М. Вдовин, Л.Е. Суркова, В.А. Валентинов. - 3-е изд. - Москва: Издательско-торговая корпорация «Дашков и К°», 2016. - 644 с.: ил. - (Учебные издания для бакалавров). Библиогр. в кн. – ISBN 978-5-394-02139-8; [Электронный ресурс]. URL: http://biblioclub.ru/index.php?page=book&id=453515 (17.01.2018).
2. Зариковская Н.В. Математическое моделирование систем: учебное пособие / Н.В. Зариковская; Министерство образования и науки Российской Федерации, Томский Государственный Университет Систем Управления и Радиоэлектроники (ТУСУР). - Томск: Томский государственный университет систем управления и радиоэлектроники, 2014. - 168 с.: схем., ил. - Библиогр. в кн.; То же [Электронный ресурс]. - URL: http://biblioclub.ru/index.php?page=book&id=480523 (19.01.2018).
3. Управление информационными системами: лабораторный практикум / Министерство образования и науки Российской Федерации, Федеральное государственное автономное образовательное учреждение высшего профессионального образования «Северо-Кавказский федеральный университет»; авт.-сост. А. Ю. Орлова. - Ставрополь: СКФУ, 2016. - 138 с [Электронный ресурс]. - URL:http://biblioclub.ru/index.php?page=book&id=459314 (17.01.2018).

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