THE WORKING PROGRAM OF THE DISCIPLINE

Name of the course: Methods of teaching informatics and computing technology in higher education

Direction of study: 09.06.01 "Informatics and computing technology"

Profile: «Mathematical modeling, numerical methods and software packages» (technical sciences)

1. **Goals and objectives of the course:**

The goal of mastering the course Methods of teaching informatics and computing technology in higher education is the development of universal and professional competencies among postgraduate students, based on understanding of fundamental problems of informatics and computing technology in order to apply the methods of teaching computer and information sciences in higher education. Comprehensive psychological and pedagogical training of postgraduate students for scientific and pedagogical activities in higher education; development of general cultural and professional competencies of future specialists, necessary for professional activity. The achievement of the goal is ensured through the solution of theoretical, practical and educational tasks.

Course objectives: the postgraduate student should know about modern methods of teaching informatics and computer technology in higher education, have an idea of gaining knowledge of the main achievements, problems and trends in the development of higher education pedagogy in Russia and abroad; modern approaches to modeling pedagogical activity; the foundations of the formation of the psychological and pedagogical culture of a teacher of higher education; psychological and pedagogical foundations of the process of teaching and education at a university; the specifics of professional activity in a higher school environment; the foundations of the formation of an individual style of activity, skills and abilities of pedagogical communication; fundamentals of pedagogical technologies and the possibility of their application in higher education; the formation of the ability to use in the educational process knowledge of basic foundations, modern achievements, problems and trends in the development of psychology and pedagogy of higher education; to intensify the cognitive activity of postgraduate students in the learning process; use methods of scientific research and the organization of collective research work and the development of independent work skills among postgraduate students, professional thinking and the development of their creative abilities; use the skills of organizing the productive activities of the teacher and graduate students; the development of skills and abilities of the organization and implementation of pedagogical activities in higher education; possession of methods of identification, generalization and implementation of advanced pedagogical experience; innovative technologies for organizing research activities; psychological methods of communication.

2. **The place of the course in the structure of Main Curriculum**

The course "Methods of teaching informatics and computing technology in higher education" belongs to the elective part of Block 1 of the curriculum. Its study is based on the material of the previous disciplines of the curriculum, the list of which is presented in Table 1

Table 1 – The list of preceding and subsequent disciplines

№ п/п	Preceding courses	Subsequent courses
1		Pedagogical practice
2		Methodology of scientific research

3. **The list of planned learning outcomes in the course, correlated with the planned results of mastering the educational program**

The course " Methods of teaching informatics and computing technology in higher education" is aimed at forming the following competencies:

- the ability to follow ethical standards in professional activity (UC-5);
- the ability to plan and solve problems of one's own professional and personal development (UC-6);
- readiness to teach the basic educational programs of higher education (GPC-8).
- the ability to develop new research methods and their application in independent research activities in the field of informatics and computer technology, taking into account the rules of observance of copyright (PC-2);
- readiness to teach courses, disciplines (modules), conduct certain types of training sessions in Russian and foreign languages in higher education programs (PC-5)

The result of studying the discipline is knowledge, abilities, skills and (or) experience of activity that characterize the stages of the development of competencies and ensure the achievement of the planned results of mastering the educational program.

4. Volume of the course and types of educational work

Table 3 – Volume of the course and types of educational work

Full-time mode

Types of lessons		Academic hours/Total	Semester 1
Class work		20	20
including:			
Lectures (L)			
Practical studies/seminars (PS)		20	20
Laboratory classes (LC)			
Course project/course paper			
Independent work, including preparing an abstract		88	88
Assessment type – graded test			
Total workload	academic hours	108	108
	credits	3	3

5. Content of the course

5.1. The content of the discipline sections

№ p/p	Name of the discipline section	Content of the section (topics)
	Introduction. Basic definitions	Basic concepts of pedagogics and didactics. The main subjects and tasks of the pedagogical psychology. Pedagogical. process. Forms of educational activities organization.
	Higher school pedagogy	Features of higher education pedagogy. Strategies for the development of new knowledge and abilities.

6	**Psychological aspects**	Psychological factors affecting the learning process.
	Engineering pedagogy	The main tasks of engineering pedagogy. Setting educational goals. Taxonomies of learning objectives.
	Programmed training	Programmed learning, problem learning, etc. Control. Validity, reliability and autheticity of control. Assessment and grade.
	Styles of pedagogical communication	Styles of pedagogical communication. Charismatic traits of the teacher.
	Representative human systems	Human representational systems. Fundamentals of pedagogical skills in higher education.

5.2. The content of the discipline sections

№ п/п	Name of course unit/ lesson topics	Lectures	PS / Seminars	Laboratory classes	Indep. work	Total amount of hours
			1 semester			
1.	Basic concepts of pedagogics and didactics. The main subjects and tasks of the pedagogical psychology. Pedagogical. process. Forms of educational activities organization.		3		12	15
2	Features of higher education pedagogy. Strategies for the development of new knowledge and abilities.		3		12	15
3	Psychological factors affecting the learning process.		3		12	15
4	The main tasks of engineering pedagogy. Setting educational goals. Taxonomies of learning objectives.		3		12	15
5	Programmed learning, problem learning, etc. Control. Validity, reliability and autheticity of control. Assessment and grade.		3		12	15
6	Styles of pedagogical communication. Charismatic traits of the teacher.		3		14	17

№ п/п	Name of course unit/ lesson topics	Lectures	PS / Seminars	Laboratory classes	Indep. work	Total amount of hours
7	Human representational systems. Fundamentals of pedagogical skills in higher education.		2		14	16
	Abstract					
	Graded test					
	Total (hours)		**20**		**88**	**108**

6. Laboratory practice-not provided

7. Practical classes (seminars) (if available)

№ p/p	№ of the discipline section	Topics of practical classes (seminars)	Labor intensity (hrs.)
1.	1.	Basic concepts of pedagogics and didactics. The main subjects and tasks of the pedagogical psychology. Pedagogical. process. Forms of educational activities organization.	3
2.	2	Features of higher education pedagogy. Strategies for the development of new knowledge and abilities.	3
3	3	Psychological factors affecting the learning process.	3
4	4	The main tasks of engineering pedagogy. Setting educational goals. Taxonomies of learning objectives.	3
5	5	Programmed learning, problem learning, etc. Control. Validity, reliability and autheticity of control. Assessment and grade.	3
6	6	Styles of pedagogical communication. Charismatic traits of the teacher.	3
7	7	Human representational systems. Fundamentals of pedagogical skills in higher education.	2

8. Educational-methodical and informational support of the discipline

Moscow, Ordzhonikidze str., 3, building 1, 5. Multimedia auditorium and equipment of the laboratory «Information Communication Management». The laboratory consists of three divisions - educational (room 110), educational and scientific (room 116) and scientific (room 123), and is equipped with modern network equipment and computer equipment (a set of Sharp PNL702B liquid crystal display, a 24" Acer V243HAOBD monitor, a system unit (Intel Core i7-2600 OEM processor <3.40 GHz, 8Mb, 95W, LGA1155(Sandy Bridge)>, 16GB OP, HDD 2 TB), a DMS800 projector with an interactive whiteboard Board 1077, HP XW7800, Intel Core2 2.4 GHz (8 pcs.)). The laboratory base allows you to carry out projects on the development of applied means of the infocommunication environment, conduct lectures and laboratory classes with multimedia teaching tools. Display classes DK3, DK4, DK6, DK7, Intel Core i3-550 3.2 GHz-60 pcs.

9. Information support of the discipline

(the list of information technologies used in the implementation of the educational process in the discipline (module) is indicated, including a list of software and information reference systems (if necessary))

a) software Standard personal computer software

b) ProjectLibre software

c) database, directory and search engine Yandex, Google

10. Educational and methodological support of the discipline:

a) main references

1. Satybaldinova Kulyash Mukhamedinovna. Philosophy and methodology of science: Teaching aid. - M.: Publishing house of RUDN, 2014 .-- 14 p.
2. Moskvichev Yuri Nikolaevich. Methodology of scientific research: Study guide for graduate students and applicants [Electronic resource]. - Electronic text data. - Volgograd: VGAFK, 2013 .-- 54 p.
3. Ruzavin Georgy Ivanovich. Methodology of scientific knowledge: Textbook for universities. - M.: UNITY-DANA, 2013 .-- 287 p.

б) additional references

1. Burgin M.S., Kuznetsov V.I. An Introduction to Modern Exact Methodology of Science: Structures of Knowledge Systems: A Handbook for University Students. - M .: JSC "Aspect Press", 1994. - 304 p.
2. 2. Kuzin F.A. PhD thesis: writing methodology, design rules and procedure for defense: A practical guide for graduate students and applicants for an academic degree. 2nd ed. - M .: "Os-89", 1998. - 208 p.
3. Ruzavin G.I. Research methodology: Textbook. manual for universities. - M .: UNIT-DANA, 1999 .-- 317 p.
4. 4. Volkov Yu.G. Dissertation: preparation, protection, registration: Practical guide / Ed. N.I. Zaguzov. - M .: Gardariki, 2001 .-- 160 p.

Periodicals:

1. http://yspu.org/ Pedagogy: _Electronic_versions_ of_magazines_and_newspapers

Basic Internet resources:

1. http://www.bytic.ru/conf.html International annual conference-exhibition "Application of new technologies in education"
2. http://www.moscow-education-online.com/ International conference on education with the use of e-learning technologies MOSCOW Education Online
1. http://tm.ifmo.ru/ All-Russian annual scientific and methodological conference "Telematics"

Resources of the information and telecommunication network "Internet":

1. Electronic library system (ELS) of RUDN and external ELSs, to which university students have access due to agreements:

- Electronic library system (ELS)RUDN – ЭБС РУДН http://lib.rudn.ru/Mega-Pro/Web

- ELS "University library online" http://www.biblioclub.ru

- ELS Yurayt http://www.biblio-online.ru

- ELS " Student advisor" www.studentlibrary.ru

- ELS "Doe" http://e.lanbook.com/

2. Websites of ministries, departments, services, manufacturing enterprises and companies whose activities are core to this discipline:

http://www.ipu.ru

3. Databases and Search Engines:
- electronic fund of legal and normative-technical documentation   http://docs.cntd.ru/
- Yandex search engine   https://www.yandex.ru/
- Google search engine https://www.google.ru/
- abstract database SCOPUS http://www.elsevierscience.ru/products/scopus/

Software:

1. Specialized software for conducting lectures, laboratory and practical classes, completing a course project / work and independent work of students:
1. Matlab 6.5 SP1/7 + Simulink 5/6.
2.Demo version Gensym G2.

Methodological materials for independent work of students and for mastering   the course (also posted in the TUIS RUDN in the corresponding section of the course):

1.   Textbook with a course of lectures on the discipline Modern instrumental means of intelligent systems.
 (*appendix 2*).
2. Training package Intellectual systems and technologies (*appendix 3*).
3. Methodical instructions for independent work of students on the discipline Instruments of intelligent systems (*appendix* 4).
4. Methodical instructions for preparing an abstract on the discipline Instrumental tools of intelligent systems (*appendix* 4).
5. Laboratory workshop on the discipline Instruments of intelligent systems (*appendix* 5).

11. Methodological guidelines for students on the development of the discipline (module)

During practical classes in the discipline, control measures are carried out in order to identify the acquired knowledge, skills, skills and competencies. As part of their independent work, graduate students study the educational and methodological support of the discipline, prepare homework, work on questions and tasks for self-preparation, search and review scientific publications and electronic sources of information. Independent work should be systematic and controlled by the teacher, taken into account by the teacher for issuing certification.

To improve the quality level of mastering the discipline, a graduate student should prepare for a lecture, since it is the leading form of organizing student learning and implements functions that contribute to:

−   formation of the basic concepts of the discipline,
−   stimulating interest in the discipline, the topics of its study,
−   systematization and structuring of the entire body of knowledge in the discipline,
−   orientations in the scientific literature that reveals the problems of the discipline.

Preparation for the lecture is as follows:

−   study of the material of the previous lecture,
−   анализ analysis of the topic of the upcoming lecture (according to the thematic plan, according to the information of the lecturer),
−   familiarization with the educational material on the textbook and teaching aids,
−   analysis of the place of the studied topic in your professional training,

–   preparation of questions that can be asked to the lecturer at the lecture.

Preparation for practical classes:

–   introduction to the practical lesson plan: first with the main questions, then with questions for discussion, assessment of the scope of the task;

–   study of the lecture summary on the topic of the practical lesson, selection of the material necessary for studying the questions posed;

–   familiarization with the recommended main and additional literature on the topic, new publications in periodicals;

    –   identification of the main concepts of the topic under study, the possession of which contributes to the effective development of the discipline;

    –   preparation of abstracts or mini-notes that can be used for public speaking in the classroom.

The working program of the discipline in terms of goals, a list of knowledge, skills, terms and educational questions can be used by you as a guide in the organization of training.

Preparation for the test. It is necessary to prepare for the test purposefully, regularly, systematically and from the first days of training in this discipline. At the very beginning of studying the discipline, the graduate student gets acquainted with the program for the discipline, the list of knowledge and skills that the graduate student should possess, control measures, a textbook, textbooks on the discipline being studied, electronic resources, a list of questions for the test.

Systematic performance of educational work at lectures, practical classes and classes will allow you to successfully master the discipline and create a good basis for passing the test.

Graduate students are required to attend classes, perform tasks of the head of the discipline, get acquainted with the recommended literature and prepare an essay for a round table (the choice of the topic of the essay is carried out in agreement with the head of the discipline and the scientific supervisor). Graduate students carry out projects, creative tasks for independent work, taking into account the profile of the disciplines that they will implement in the course of industrial practice. The results of completing tasks for independent work are evaluated on the basis of a point-rating assessment and are reflected in the educational route of the graduate student. When certifying a graduate student, the quality of work in the classroom is evaluated (the ability to conduct a scientific discussion, the ability to clearly and succinctly formulate their thoughts), the level of preparation for independent research activities of a specialist in the field of higher school pedagogy, the history of pedagogy and education, the quality of tasks (presentations, reports, analytical notes, etc.).

12. Performance assessment documentation package for the intermediate certification of students in the discipline (module)

Materials for assessing the level of mastering the educational material of the discipline " Methods of teaching informatics and computing technology in higher education " (evaluation materials), which include a list of competencies indicating the stages of their formation, a description of indicators and criteria for evaluating competencies at various stages of their formation, a description of assessment scales, standard control tasks or other materials necessary for evaluating knowledge, skills, skills and (or) experience of activity that characterize the stages of competence formation in the process of mastering an educational program, methodological materials that determine the procedures for evaluating knowledge, skills, skills and (or) experience of activity that characterize the stages of competence formation are fully developed and are available to students on the discipline page in the TUIS RUDN.

The program is compiled in accordance with the requirements of OS VO RUDN

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