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«Национальный исследовательский университет «Высшая школа экономики»

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«___»_____2016 г.

Программа дисциплины

«Научно-педагогическая практика»

для направления 09.04.04 «Программная инженерия»

подготовки магистратуры

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Course Information

Specification Author:

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Subject Title in English:

- Scientific-pedagogical practical training

1. Application Guidelines and Regulations

This program establishes minimum requirements for knowledge and skills of the student and determines the content and types of the sessions and reports. The program is targeted at professors, teaching this discipline, educational/teaching assistants, and students getting a master's degree in Software Engineering (09.04.04).

The program is designed in accordance with:

- Educational standards of the Federal State Autonomous Educational Institution of Higher Professional Education "National Research University “Higher School of Economics”", adjusted in 2010;
- Educational program for Master Training for track 231000.68 "Software Engineering", approved in 2011;
- Working curriculum of the University for Master training for track 09.04.04 "Software Engineering», approved in 2016.

The specification is intended to be used as a source of information by:

- students and prospective students;
- lecturers for delivering lectures and conducting practical classes on related disciplines;
- professional and/or statutory regulatory bodies for carrying out accreditation.

2. Course Objective

The main purpose of the Scientific-pedagogical practical training (following – “practice”) is to develop readiness and ability to exercise methodologically grounded professional and educational activities within the training and certification of software users, as well as training sessions and classes for bachelor students in the Software Engineering disciplines.

- The main objectives of Scientific-pedagogical practical training are:

1. Preparing Masters (as potential teachers) to the implementation of professional educational programs and curricula on the level prescribed by the state and original educational standards of higher professional education.

2. Development of Masters' willingness and ability to apply contemporary educational technologies and choose the optimal teaching strategies based on the level of students` learning.
3. Development of Masters' skills for construction of methodological materials for educational complexes, conducting seminars or workshops for students and adult software users.
4. Establishing and strengthening the connection between theoretical knowledge of psychological and pedagogical disciplines with professional and educational activities in engineering and computer sciences.

Scientific-pedagogical practical training is a significant component of the basic educational program training masters of software engineering, refers to the cycle of practices (M3 according to the educational standards for Magistrates in Software Engineering). Scientific-pedagogical practical training is conducted on the 2nd year in two weeks during the first - third modules, with a margin of training sessions at the Department of software development with administrative support by the head of the practice, associated professor form the of Organizational Psychology Chair at Department of Psychology on Social Science Faculty of the HSE.

During the practice Masters are become acquainted with contemporary methods of academic work at the university, with the content and features of the pedagogical activity of teachers of the department, with their educational experience. They gain the experience of teaching and communicative practice with students, colleagues, and staff of Software Engineering Department.

3. Learning Outcomes

In the course Scientific-pedagogical practical training Master's program students should expand and deepen theoretical knowledge in:

- Basic principles, methods and forms of organization of the educational process at higher education and principles of the training of adults (software users);
- Techniques for monitoring and assessment of professionally important qualities and competencies of learners (students and adults);
- Requirements for high school teacher and for professional and educational development.

After completion the practice Masters should increase their skills and abilities of:

- Implementation of methodological educational insights into the educational process at the university and / or at the workplace.
- Public speaking to audience and ability to create a productive atmosphere in the process of teaching and learning.
- Analyzing difficulties emerging in teaching activities and developing of action plan to hold or overcome them.
- Conducting the psychological and pedagogical research.
- Developing self-control, self-reflection, and self-assessment of process and results of their professional and educational activities.

As a result of the Scientific-pedagogical practical training Masters should gain following instrumental competencies:

Code of competence	Competencies	Descriptors - the main features of the development (indicators of achievement results)	Forms and methods of training, contributing to the formation and development of

			competence
IC – M.6.1.Ped (PI)	Ability to implement psychological pedagogical methods in the professional activity.	• Master uses teaching materials and topical articles on pedagogical methods in the professional activities of software engineers. • Master applies the knowledge of contemporary psychological and pedagogical methods for planning and conducting of sessions with students and / or adults.	• Group work during induction, intermediate, and final sessions. • Analytical review of contemporary psychological and pedagogical methods for teaching at higher education and education of adult software users.
IC – M.6.2.Ped (PI)	Ability to use teaching methods, principles of training and certification of software users in the learning process.	• Master develops and conducts training and certification activities for software users. • Master applies knowledge of contemporary psychological and pedagogical methods and learning methods of adults in the development and implementation of training and certification of users.	• The practice of self - planning and the conducting of teaching and certification of software users. • Feedback from software users.
IC – M.6.3.Ped (PI)	Ability to prepare and conduct training sessions on the disciplines for educational direction "Software Engineering".	• Master develops and conducts training sessions for bachelors of the direction "Software Engineering". • Master work as teaching assistant on bachelor program "Software Engineering". • Master applies knowledge of contemporary psychological and pedagogical methods in the planning and implementation of classes with bachelors of the direction "Software Engineering".	• The practice of the development of the fragments for educational complex and / or conducting classes (in accordance with the requirements and agreement with the head of practice). • Feedback from the research supervisor or the head of the practice.

4. Discipline in the Educational Program

The guidance of Scientific-pedagogical practical training provided by the head of practice, which:

- conducts the practice in accordance with the program (carried out by the induction, intermediate, and final conference, ensures the schedule of practice);
- provides the organization, conduction, and evaluation of the Scientific-pedagogical practical training;
- selectively attends training sessions in order to observe the work of the Masters;
- exposes the final grade for the conduct of practices on the basis of accounting documents and statements made in the final conference;

- prepares a report on the results of the practice and provides it to the Educational and Methodical Department in terms established by University.

There are two main target group: youngers (students, pupils) and elders (adult software users). Scientific-pedagogical practical training should cover both of them.

Induction session is conducted at the start of the Scientific-pedagogical practical training in form of 1-2-hours meeting, at which Masters become acquainted with purposes, objectives, content, organizational forms, and reporting formats. The task assigned to Masters on this session is to develop an individual plan of Scientific-pedagogical practical training, which should be confirmed by the Head of the Scientific-pedagogical practical training and included to the Diary of practice (Appendix 1).

Intermediate session is conducted in the middle of Scientific-pedagogical practical training as colloquium (2-4 academic hours) devoted to the analytical part of the Scientific-pedagogical practical training, in which Masters individually present a brief overview according selected topics on the teaching of computer science, on innovative educational technology, information and communication techniques. Some materials may be provided for Masters by the Head of the Scientific-pedagogical practical training upon their requests.

Colloquium consists of two parts: the presentation of analytical reports on bachelors learning and presentation of analytical responses on adults or software users learning. Preparation of PowerPoint presentations is not required. Colloquium is conducting in the form of short messages (5 min.) of each Master in two formats of analytical activities and subsequent discussion.

Final session is conducted at the end of Scientific-pedagogical practical training in the format of the mini-conference (4-6 academic hours) at which Masters would defend presentations (7-10 minute) of their projects (based on the results of the practice). In addition, they will discuss their teaching experience, create a list of methodological recommendations on improving the professional and educational activities of software engineers.

Since the targeted audiences for the training of teaching skills are university students and adult users, each of the following activities should be covered in each target groups.

The content of Scientific-pedagogical practical training includes:

Analytical activity

- Introduction to the contemporary educational technologies and experience of their implementation into the educational process.
- Preparation of short analytical review of relevant articles on the teaching of computer science in educational institutions.
- Preparation of short analytical review presenting technical information or a learning experience of adult users of software products (the training and / or certification of users).

Methodical activity

- Development of the methodical fragment included in Educational complex (EC) (at the request of a scientific leader or a head of the practices) for teaching bachelors.
- Preparation the guidelines for software users' training.

Pedagogical (teaching) activity

- Development and conducting the fragment of the classes (1-2 academic hours) at practical classes, seminars, course projecting, advising students on the proposed

research topics by supervisor with bachelors of Software Engineering. Work as teaching assistant. Receiving feedback from the participants.

- Development and implementation of training session (1-2 academic hours) with adult users of software products. Receiving feedback from the users after event.

The above-mentioned examples are related to the actions of analytical, methodical, and pedagogical activities. Master may choose any convenient format of describing their actions in the individual plan of Scientific-pedagogical practical training.

Possible content of the fragments at the educational complex: planning and conducting lectures, practical and laboratory classes with the use of innovative educational technologies;

- creating and conducting lectures, practical and laboratory classes with the use of innovative educational technologies;
- developing of multimedia systems on disciplines for bachelors leaning "Software Engineering";
- translating a part of the course into English;
- transforming a part of the course into the LMS;
- developing test materials, test, examination tasks, topics for course and diploma projects;
- constructing teaching materials on specific topics for some training courses;
- creating scenarios of business games, teleconferencing and other innovative forms of employment;
- developing procedures for assessing personal and business skills of students of software engineering;
- conducting psychological and educational research on the diagnosis of professional, business and personal competencies of students of software engineering and the analysis of the results;
- etc.

5. Grading and Assessment

Type of control	**Form of control**	**Second year**				**Department**	**Options**
		1	2	3	4		
Final	Checkup			*		Department of Psychology (Organizational Psychology Chair)	Scoring is performed in the form of the final session as a mini-conference with presentations and defending projects based on the Diary of the practice

The list of fragments of educational complex and topics of Scientific-pedagogical practical training might be supplemented by the format proposed by Masters (in agreement with the head of the practice). When designing fragments for educational complex, materials should been guided by the relevance for scientific supervisor, as well as for the department, which conducts practice, as well as the theme of master's project. The amount of work on the methodological part should be confirmed by the head of the practice. It is included in the individual plan at the Diary of Practice (Appendix 1).

All materials must be printed to the final session (the font Times New Roman, 12 pt, single-spaced) and must be sent in advance (in 3 days before the sessions) by e-mail to the head of the practice.

The results of every activity should be submitted in the following types of reports:

Activities	**Types of reports**
Analytical	• Overview of the contemporary state of psychological and pedagogical methods in teaching engineering students. • Analytical note on software user`s training and a list of references.
Methodical	• Methodical material on choose fragment of the educational complex for students. • Guidelines for software users.
Pedagogical (teaching)	• Summary of conducted classes and analysis of feedback from students of software engineering. • Summary report and analysis of feedback from adult users of software products after conducted training session.

All documents should be included to the Diary of practice (Appendix 1), which is the final document on practice. Diary includes:

- Cover Sheet
- Individual plan of the Scientific-pedagogical practical training
- Analytical review of the current state of psychological and pedagogical methods for teaching engineering students
- Analytical essay, devoted to the features of adult software users learning
- Materials of the educational complex for students
- Materials of the educational complex for software users
- Description of the teaching experience with students
  - Plan-summary of the classes for students
  - Report with feedback analysis from students
- Description of teaching experience with adult users of software products
  - Plan - summary of the session for adult users of software products
  - Report with feedback analysis from software users
- Presentation of the results of educational research and pedagogical practices for the final conference
- Resume of the practice
- Applications

Self-examination of the experience of professional and educational activities can be presented both in free form and in the proposed scheme (see relevant parts of Dairy of practice).

Diary of practice should be sent to the head of scientific and pedagogical practice 3 days prior to the final conference. Presentation with the results of practice in PowerPoint format which would be presented at the final conference, to be applied to the Diary of practice.

Final control of Scientific-pedagogical practical training is held in the form of exam at final conference (10 - point evaluation system).

If the Masters did not fulfill the practice completely, they will not be allowed to set-off. In this case, as well, if the Master receives a failing grade ("not passed"), the student will implement the practice next year. Negative estimate obtained on Scientific-pedagogical practical training is considering as academic debt.

The resulting marks is exhibiting by the head of practice according to the following formula, where $R_{Conference}$ – assessment of the final conference with the presentation of the results of practice; $R_{Analytical}$ – assessment of the analytical part of the practice; $R_{Methodical}$ – assessment of the methodical part of the practice; $R_{pedagogical}$ – assessment of the teaching part of the practice:

$$Final\ Rating = 0{,}3 \times R_{conference} + 0{,}2x\ R_{analytical} + 0{,}2 \times R_{methodical} + 0{,}3 \times R_{pedagogical}$$

The method of rounding cumulative rate of the final control in the form of set-off is arithmetic (for ex., evaluation of 4.4 rounded up to 4, and the assessment of 4.5 to 5).

The final rate obtained on Scientific-pedagogical practical training is exhibiting in the Diploma.

6. Educational, methodical and informational support of discipline

Reader of the articles.

Electronic versions of educational research and methodological papers will be available and distributed at students request (in Russian and English).

Discipline is available in LMS.

7. Material and technical support of discipline

Laptop, viewer, speakerphones, markers and board for fixation of the group discussions and results, handouts for Masters` presentations are required for induction, intermediate, and final session.

8. Applications.

Appendix 1. Dairy of Scientific-pedagogical practical training.

The author of the program: Ovchinnikova E.

Appendix 1. Dairy of Scientific-pedagogical practical training.

Government of the Russian Federation

Federal state autonomous educational institution
of higher professional education
National Research University
"Higher School of Economics"

DAIRY OF
SCIENTIFIC-PEDAGOGICAL PRACTICAL TRAINING

Master student of 2nd -year master's program at Software Engineering Department of the Computer Science Faculty

_____
(Full name)

Place of the practice_____

Terms of practice: from _____ till _____ 20__.

Head of practice: _____
(Position, surname, initials)

The recommended marks for:

Final conference _____

Analytical activity _____

Methodical activity_____

Pedagogical activity_____

Final mark for Scientific-pedagogical practical training _____

Moscow, 2015-2016

1. Individual plan[1]

№	Terms of task (month, dates)	Types of work (analytical, methodical,pedagogical activities for students and adult software users)	Expected result	Notes

2. Analytical overview of the contemporary psychological and pedagogical methods in teaching engineering students.

Describe your insights.

3. Analytical note on features of software user`s training.

Describe your insights.

4. Methodical material on chosen fragment of the educational complex for students.

Describe work you have done.

5. Methodical material on chosen fragment of the educational complex for software users.

Describe work you have done.

[1] Individual plan should be filled after the induction session and be confirmed with the Head of the Scientific-pedagogical practical training via e-mail.

6. Pedagogical (teaching) experience with students

Plan- summary of session for students

№	**Actions** (Phased work plan)	**For what** (Purpose, developing competences / knowledge /abilities / skills)	**How** (Description of teaching methods, ways of presenting the material, required resources)	**When** (the time required for action)
1				
2				
…				
….				

Feedback analysis from students

After classes students provide anonymous written feedback on taken classes, where they mark the pro's and con's of lessons (what "work well" and what should be done another way). Masters analyze feedback, add their observations on the work have been done, and formulate recommendations for the future development:

- what "worked well" (was suitable) in classes, what should be preserved for the future teaching experience (mark it in the column "Continue doing");
- what you did not do in classes, but it was necessary to begin dingo in the future teaching practice (mark this in the column "Start doing");
- what you have done in classes, but it should be removed from your future teaching practice (mark this in the column "Stop doing").

Continue doing	**Start doing**	**Stop doing**
•	•	•

7. Pedagogical (teaching) experience with adult software users

Plan-summary of session / classes for software users

№	**Actions (Phased work plan)**	**For what (Purpose, developing competences / knowledge /abilities / skills)**	**How (Description of teaching methods, ways of presenting the material, required resources)**	**When (the time required for action)**
1				
2				
…				
….				

Feedback analysis from students

After classes users provide anonymous written feedback on conducted classes, where they mark the pro's and con's of lessons (what "work well" and what should be done another way). Masters analyze feedback, add their observations on the work have been done, and formulate recommendations for the future development:

- what "worked well" (was suitable) in classes, what should be preserved for the future teaching experience (mark it in the column "Continue doing");

- what you did not do in classes, but it was necessary to begin dingo in the future teaching practice (mark this in the column "Start doing");

- what you have done in classes, but it should be removed from your future teaching practice (mark this in the column "Stop doing").

Continue to do	Start doing	Stop doing
•	•	•

Presentation of the results of Scientific-pedagogical practical training at the final conference (printed version and the presentation as a slide show should be added as **Appendixes** to the Diary).

8. Analysis of Scientific-pedagogical practical training

Describe how the results of the practice corresponds with your expectations in the beginning of the practice (explain, if don't correspond)

…

What difficulties/obstacles have you met in the course of the practice?

…

What decisions have you offered or what actions have you made for resolving these difficulties?

…

What kind of competences have you developed (knowledge, abilities, or skills) when passing following types of activities at the practice:

Analytical:

…

Methodological:

…

Pedagogical:

…

Presentational (presentation of the results, participation at the colloquium):

…

Self-estimate (on 10-point scale) the results of your Scientific-pedagogical practical training _____

First and last name, signature of the Master

_____ _____

"_____" _____ 20___

Appendix. …