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ФИО: Ястребов Олег Александрович
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**Federal State Autonomous Educational Institution for Higher Education
Peoples' Friendship University of Russia named after Patrice Lumumba
(RUDN University)
Engineering Academy**

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

Base Department "Power Engineering"

(department realizing the PhD program)

INTERNSHIP SYLLABUS

Pedagogical Training

(internship type)

Scientific specialty:

2.4.7 Turbomachines and Piston Engines

(scientific speciality code and title)

The PhD student's internship is implemented within the PhD programmes:

Turbomachines and Piston Engines

(PhD program title)

2025

1. INTERNSHIP GOALS

The purpose of the Pedagogical practice is:

- formation And development at graduate students competencies V accordance With leveleducation and professional standard;
- development skills teaching activities V areas engines internal combustion (steam and gas turbines) and related fields of technical knowledgeV higher school;
- acquisition skills work V scientific and pedagogical team.

Main tasks pedagogical practice _ are:

- to study modern information and technical means that contribute tooptimization educational process;
- learn conduct classes By technical disciplines;
 - master methods And methods learning And education V higher school;
- participation V modeling classes, compiling programs And projects, planning individual classes and forecasting a special course, choosing an effective strategies organizations;
- analysis of the current state of quality and level of teaching disciplines to students on programs undergraduate And magistracy.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Conducting "Pedagogical practice" is aimed at mastering the following competencies:

know:

content taught subject;

basic methods and methods of teaching in higher education; modern technologies collection, processing And representation information;

be able to:

use theoretical knowledge in the pedagogical process; to interact With international student audience With taking into account its features; design educational process With using contemporary technologies; formalize report By practice.

Own:

the necessary theoretical foundations of the discipline being taught;

main methods processing information;

means communications V professional pedagogical activities;skills self-esteem and self-control.

3. INTERNSHIP WORKLOAD

The total labor intensity of "Pedagogical Practice" is 5 credits (180 academic hours).

4. INTERNSHIP CONTENTS

*Table 4.1. Practice content**

Name of practice section	Contents of the section (topics, types of practical activities)	Labor intensity, acc.h.
Section 1. Organizational and preparatory	Receipt individual tasks on practice from leader.	1
	Safety training at the workplace (in the laboratory and / or in production). Setting the goal and objectives of the practice. Review And analysis information according to assigned disciplines.	1
Section 2. Main	Conducting various types of training sessions. The study of regulatory documents, the structure of the educational process, the programs of courses taught.	70
	Attendance at teachers' classes; independent preparation of plans and abstracts of classes in academic disciplines; selection and analysis of basic and additional literature.	60
	Participation in scientific and practical n, seminars and meetings of methodological sections; participation in the activities of the department for the development of work programs for the disciplines of the department.	20
	Current control passing practices from the side leader.	7
	Doing diary passing practices.	3
	Preparation of a practice report	9
Section 3. Reporting .	Preparation for defense and defense of the practice report	9
	TOTAL:	180

* - the content of practice by sections and types of practical training is FULLY reflected in the student's report on practice.

5. INTERNSHIP EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Laboratories, classrooms, specially equipped rooms, household premises scheniya , corresponding to the current sanitary and fire safety standards, and as well as safety requirements during training and research and production works.

- computer Class For holding settlement works;
- multimedia projector;
- working stands For tests centrifugal compressor, steps turbines, thermal pump;
- stands For diagnostics details of PGT (ultrasound, magnetic control);
- installations For static And dynamic balancing rotors turbomachines;
- research propulsion systems IDT And FIT;
- fuel stand For research fuel pumps high pressure standFor electromagnetic research nozzles

Table 5.1. Logistics of discipline

Audience type	Audience equipment	Specialized educational / laboratory equipment, software and materials for mastering the discipline (if necessary)
Lecture	An auditorium for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations.	projector, screen, computer, chalkboard
Seminar	An auditorium for conducting seminar-type classes, group and individual consultations, current control and intermediate certification, equipped with a set of specialized furniture and technical means for multimedia presentations.	projector, screen, computer, chalkboard
For independent work of students	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to the EIOS.	projector, screen, computer, chalkboard

6. INTERNSHIP LOCATION AND TIMELINE

"Pedagogical practice" can be carried out both in the structural divisions of the RUDN University or in organizations in Moscow (stationary), and at bases located outside of Moscow (exit).

Conducting an internship on the basis of an external organization (outside the RUDN University) is carried out on the basis of an appropriate agreement, which specifies the terms, place and conditions for conducting an internship in the base organization.

The terms of the practice correspond to the period indicated in the calendar study schedule of the postgraduate program. The timing of the internship can be adjusted upon agreement with the Department of Educational Policy and the Department for Organizing Practices and Employment of Students at RUDN University.

7. RESOURCES RECOMMENDED FOR INTERNSHIP

Main literature:

1. Modern computer technologies: textbook / R.G. Khismatov , R.G. Safin, D.V. Tuncev , N.F. Timerbaev ; Ministry of Education and Science of Russia, Federal State Budgetary Educational Institution of Higher Professional Education "Kazan National Research Technological University". - Kazan: KNRTU Publishing House, 2014. - 83 p.: schemes. - Bibliography . in book. - ISBN 978-5-7882-1559-4; Access mode: <http://biblioclub.ru/index.php?page=book&id=428016>
2. Shatalov I.K., Antipov Yu.A. Laboratory workshop on the course "Technical operation and repair of steam and gas turbine plants". For students of III-IV courses studying in the direction of "Power Engineering". - M.: Publishing House of UDN, 2009.- 24\12
3. Shatalov I.K., Antipov Yu.A. Calculation of characteristics of single-shaft gas turbines. For students of III-IV courses studying in the direction of "Power Engineering". - M.: Publishing House of UDN, 2016. - 26 p.

4. Trukhniy A.D., Lomakin B.V. Cogeneration steam turbines and turbine plants. Tutorial. M. MEI Publishing House, 2002, 540 p.
5. Shatalov I.K. Heat pump installations driven by heat engines: Uch. allowance. Moscow: RUDN University, 2009
6. Shatalov I.K., Barsky I.A. Regulating characteristics of gas turbine plants, schemes and determination of the main parameters of the CCGT. M. RUDN University, 2003, 124 p.
7. Sharipov, F.V. Pedagogy and psychology of higher education: textbook / F.V. Sharipov . - Moscow: Logos, 2012. - 448 p. - (New University Library). - ISBN 978-5-98704-587-9; The same [Electronic resource]. - URL: <http://biblioclub.ru/index.php?page=book&id=119459>
8. Kavdangalieva, M.I. Pedagogy and psychology of higher education. Electronic course [Electronic resource]: study guide / M.I. Kavdangaliev . — Electron. Dan.
9. St. Petersburg: IEO SPBUTUIE, 2010. - 184 p. - Access mode: <https://e.lanbook.com/book/63896>
10. Fedotov, B.V. General and professional pedagogy. Theory of learning: textbook / B.V. Fedotov. - Novosibirsk: Novosibirsk State Agrarian University, 2011. - 215p.; The same [Electronic resource]. - URL: <http://biblioclub.ru/index.php?page=book&id=230538>

Additional literature:

1. Fundamentals of scientific research and patent science : teaching aid / comp. V.A. Valkov, V.A. Golovatyuk, V.I. Kochergin, S.G. Schukin. - Novosibirsk: Novosibirsk State Agrarian University, 2013. - 228 p. Access mode: <http://biblioclub.ru/index.php?page=book&id=230540>
2. Erofeev, V. L. Heat engineering in 2 volumes. Volume 1. Thermodynamics and the theory of heat transfer: a textbook for undergraduate and graduate studies / V. L. Erofeev, A. S. Pryakhin, P. D. Semenov; edited by V. L. Erofeev, A. S. Pryakhin. - Moscow: Yurayt Publishing House, 2019. - 308 p. — (Bachelor and Master. Academic course). - ISBN 978-5-534-01738-0. — Text: electronic // EBS Yurayt [website].
a. URL : <https://www.biblio-online.ru/bcode/433336>
3. Erofeev, V. L. Heat engineering in 2 volumes. Volume 2. Energy use of heat: a textbook for undergraduate and graduate studies / V. L. Erofeev, A. S. Pryakhin, P. D. Semenov; edited by V. L. Erofeev, A. S. Pryakhin. - Moscow: Yurayt Publishing House, 2019. - 199 p. — (Bachelor and Master. Academic course). - ISBN 978-5-534-01850-9. - Text: electronic // EBS Yurayt [website].
a. URL : <https://www.biblio-online.ru/bcode/434256>
4. Energy saving in heat energy and heat technologies : textbook. for universities. Ed. A.V. Klimenko. - M.: MPEI, 2010. - 424 p.
5. Andrizhnevsky A.A., Volodin V.I. Energy saving and energy management. Minsk: Higher School, 2005
6. Ametistov E.V. (ed.). Fundamentals of modern energy. M. MPEI Publishing House, 2004, in 2 parts.
7. Tsanev S.V. and other Gas-turbine and steam-gas installations of thermal power plants. M. MPEI Publishing House, 2009, 584p.
8. Antipov Yu.A. et al. "Methodological guide to the laboratory work "Testing a centrifugal compressor". M. RUDN, 2019.
9. Stolyarenko, A.M. General pedagogy: textbook / A.M. Stolyarenko. - Moscow:

Unity -Dana, 2015. - 479 p. - Bibliography . in book. - ISBN 5-238-00972-0; The same [Electronic resource]. - URL: <http://biblioclub.ru/index.php?page=book&id=436823>

Periodic editions:

1. gas turbine technologies.
2. Chemical And oil and gas mechanical engineering.
3. Thermal power engineering.
4. Engine building.
5. Automotive industry.
6. Automotive transport on alternative fuel.

Resources of the information and telecommunications network "Internet":

1. RUDN ELS and third-party ELS, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System - RUDN EBS <http://lib.rudn.ru/MegaPro/Web>
- ELS "University Library Online" <http://www.biblioclub.ru>
- EBS Yurayt <http://www.biblio-online.ru>
- ELS " Student Consultant" www.studentlibrary.ru
- EBS "Lan" <http://e.lanbook.com/>
- EBS "Trinity Bridge"

2. Databases and search engines:

- electronic fund of legal and normative-technical documentation <http://docs.cntd.ru/>
- Yandex search engine [https:// www .yandex.ru/](https://www.yandex.ru/)
- Google search engine <https://www.google.ru/>
- abstract database SCOPUS [http:// www .elsevierscience.ru/ products / scopus /](http://www.elsevierscience.ru/products/scopus/)

*Educational and methodological materials for internship, filling out a diary and preparing an internship report *:*

1. Safety rules for the passage of Pedagogical practice (initial briefing).
2. The general arrangement and principle of operation of technological production equipment used by students during their internship; flow charts and regulations, etc. (if necessary).

3. Guidelines for filling in a diary by students and preparing a practice report.

* - all educational and methodological materials for internship are posted in accordance with the current procedure on the internship page in TUIS!

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM FOR EVALUATION OF PHD STUDENTS' COMPETENCES LEVEL AS INTERNSHIP RESULTS

Assessment toolkit and a grading system to evaluate the level of competences (competences in part) formation as the course results are specified on the TUIS platform.

DEVELOPERS:

Associate Professor of the
Department of Power
Engineering

Oshchepkov P.P.

Position, BUP

Signature

Surname I.O.

HEAD OF BUP:

Head of the Department of
Power Engineering

Radin Yu.A.

Name of BUP

Signature

Surname I.O.