

**Ministry of Education and Science of the Republic of Tajikistan**  
**State Educational Institution**  
**Khujand State University**  
**named after academician Babacan Gafurov”**  
**Department of Electronics**

# SYLLABUS

**(Working - curricular)**

On subject:

**«RESEARCH BASED LEARNING»**

**Form of training:** daytime,

**Credit:** 2

**Half year:** 1

**Circular control:** 1.2

**Final exam:** orally.

**Semester job:** has.

This syllabus was compiled on the basis of the module and the curriculum approved at a meeting of the Educational and Methodological Council of the State Educational Institution “Khujand State University named after Academician Babacan Gafurov”

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Approved at a meeting of the Educational and Methodical Council of the Department of Electronics.

Protocol No. \_\_ of "\_\_\_" \_\_\_\_\_ 2020

Head of the Department, Associate Professor \_\_\_\_\_ Juraeva H.

## I. General Information

<b>The full name of the cycle: Introduction to the course “RESEARCH BASED LEARNING”</b>			
Language of Learning: Tajik, Russian and English	Final control form: Exam (orally)	Full name of responsible person (address, phone)	Total credits-2 (48 hours)
Type of training course: Elective.	The period of training: First half of the 2020-2021 academic year		

## II. Educational and methodical materials for the subject

1. Research Methodology. Concepts and cases. Deepak Chawla. Neena Sondhi/ India 2016
2. Bordens, K. S., & Abbott, B. B. (2013). Research Design and Methods: A Process Approach (9th ed.). Boston: McGraw-Hill.
3. Devlin, A. S. (2006). Research Methods: Planning, Conducting, and Presenting Research. Belmont, CA: Wadsworth/Thomson Learning
4. Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International.
5. Peters, C. A. (2001). Statistics for analysis of experimental data. Environmental engineering processes laboratory manual, 1-25.
6. Puangpet Phakhang. The development of instructional in Mathematics of Mathayomsuksa III students using Research-Based Learning. Mahasarakham: Mahasarakham University
7. Жунусова М.А., Власова Л.М., Реметова Н.С., Внедрение research-based learning технологии для студентов специальности «Биология» в медицинском вузе // Химия и биология:электрон. научн. журн. - 2015. - №3(12). - С. 88-96.
8. Тайжанова Д.Ж., Романюк Ю.Л. Внедрение исследовательских проектов для самостоятельной работы обучающихся по дисциплине внутренние болезни // Межд. журнал прикладных и фундаментальных исследований. - 2016. - №2. - С.97-98.
9. Жаутикова С.Б., Ф.С. Абикенова, А.Х. Абушахманова. Опыт внедрения элементов научно-ориентированного обучения (RBL) в учебный процесс

- на кафедрах патологической физиологии и общей фармакологии. Мед.и фарм. Образование // Медицина и экология. - 2016. - №3. - С. 156-159.
10. Кемелова Г.С., Газалиева М.А., Ахметова Н.Ш., Макаренко Т.В., Наджарян Л.К. Научно-ориентированное обучение в медицинском образовании // International journal of applied and fundamental research.- 2015. - №12. - С.1866-1872.
  11. David Randall, Peter Metherall, Karna Dev Bardhan, Paul Spencer, Richard Gillott, Rebecca de Noronha, John W Fenner. The Oculus Rift virtual colonoscopy: introducing a new technology and initial impressions. Journal of Biomedical Graphics and Computing. [Online] March 2016. <http://www.sciedu.ca/journal/index.php/jbgc/article/view/8328/5170>
  12. Discovery. MythBusters: Shark Shipwreck (360 Video) . <https://www.youtube.com>. [Online] August 27, 2015. <https://www.youtube.com/watch?v=aQd41nbQM-U>.
  13. BLICK. 360° cockpit view | SWISS Airbus A320 | Geneva - Zurich. <https://www.youtube.com>. [Online] August 14, 2015. <https://www.youtube.com/watch?v=HEEIZZ7UjRg>.
  14. L.E.K. Spotlight on Media & Entertainment: Virtual Reality. <http://www.lek.com>. [Online] June 2015. [http://www.lek.com/sites/default/files/Virtual-Reality-Adoption\\_ExecutiveInsights\\_Spotlight3.pdf](http://www.lek.com/sites/default/files/Virtual-Reality-Adoption_ExecutiveInsights_Spotlight3.pdf).
  15. Google. Get your Cardboard. Google Cardboard. [Online] 2016. <https://www.google.com/get/cardboard/get-cardboard/>.
  16. Moshima, Yoshi. Oculus Rift DK2: The world is ready for virtual reality . <http://www.vrbites.com/>. [Online] November 20, 2014. <http://www.vrbites.com/reviews/oculus-rift-dk2-the-world-is-ready-for-virtual-reality/>.
  17. Foundation, National Science. FOUNDATIONS. National Science Foundation. [Online] January 19, 2000. <http://www.nsf.gov/pubs/2000/nsf99148/pdf/nsf99148.pdf>.
  18. Life Noggin Team. What Happens Inside Your Body? - VR 360° . [Online] August 10, 2015. [https://www.youtube.com/watch?v=-FyN5\\_-njAU](https://www.youtube.com/watch?v=-FyN5_-njAU).
  19. Google. What is Expeditions? [Online] 2016. [https://support.google.com/edu/expeditions/answer/6335093?hl=en&ref\\_topic=6334250](https://support.google.com/edu/expeditions/answer/6335093?hl=en&ref_topic=6334250).
  20. Федотова Е. Л. Инновационные образовательные методы и технологии в условиях информатизации университета. Проблемы общественного развития и образования // Экономические и социально-гуманитарные исследования. - 2010. - №3(4). - С.125-132.
  21. Тайжанова Д.Ж., Романюк Ю.Л. Внедрение исследовательских проектов для самостоятельной работы обучающихся по дисциплине внутренние

- болезни // Международный журнал прикладных и фундаментальных исследований. - 2016. - №2. - С.97-98.
22. Лебедева О.В. Формирование методической компетентности учителя в области организации исследовательской деятельности // Вестник Нижегородского университета им. Н.И. Лобачевского. - 2010. - №5(2). - С. 403-406.
23. Henk Dekker, Sylvia Walsarie Wolff. Re-inventing Research-Based Teaching and Learning. Paper prepared for presentation at the meeting of the European Forum for Enhanced Collaboration in Teaching of the European University Association in Brussels // Centre for Education and Learning (CEL). - 2016. - P.1-16.
24. Жунусова М.А., Власова Л.М., Реметова Н.С., Внедрение research-based learning технологии для студентов специальности «Биология» в медицинском вузе // Химия и биология:электрон. научн. журн. - 2015. - №3(4). - С. 12-18.
25. Кемелова Г.С., Газалиева М.А., Ахметова Н.Ш., Макаренко Т.В., Наджарян Л.К. Научно -ориентированное обучение в медицинском образовании // International journal of applied and fundamental research. - 2015. - №12. - С.1866-1874.
26. Жаутикова С.Б., Ф.С. Абикенова, А.Х. Абушахманова. Опыт внедрения элементов научно-ориентированного обучения (RBL) в учебный процесс на кафедрах патологической физиологии и общей фармакологии // Мед.и фарм. образование. Медицина и экология. - 2016. - №3. - С. 156-159.

### **III. Name of technology, visual aids and other training materials.**

- 3.1. Computer.
- 3.2. Electronic board.
- 3.3. Video projector.
- 3.4. Presentations and others.

### **IV. Information about the general requirement for the subject**

Course Title	Research Based Learning
Course status in the programme	Elective
Course level	PhD and Master degree students
Responsible Instructors	<p>Khujand State Univerity,</p> <ul style="list-style-type: none"> <li>➤ Karimov Temurjon</li> <li>➤ Vahobov Abduvahob</li> <li>➤ Sidiqov Abduvosid</li> <li>➤ Istgamkulov Jamshed</li> </ul>
Role of the Instructor	<ol style="list-style-type: none"> <li>1. Karimov Temurjon – senior lecturer at Cultural Studies Department</li> <li>2. Vahobov Abduvahob – researcher of the university, docent of the telecommunication department</li> <li>3. Sidiqov Abduvosid – senior lecturer of the department of electronics</li> <li>4. Istgamkulov Jamshed - International Relations Office MA &amp; MBA</li> </ol>
Maximum Auditorium Capacity	15 to 60 people
Possibility of Distance Learning	The possibility of distance learning exists. The course materials will be placed in a special website organized on the basis of the MOODLE program in the mobile Internet network, which can be used by anyone wishing to conduct scientific and research activities from all corners of Tajikistan and abroad.
Language of Instructions	RU, TJ, EN
Volume of the Course	48 hours
Course Description	The training course is based on the competent and active approach discussed during the previous training workshops in Bucharest and Portugal. The main argument of the course is an innovative approach and unity of theory and practice. The relevance of the course is in the unity of theory and practice, in connection with professional teaching, in the unity of research, design and practical activities of graduate students, postgraduates, which

contributes to the development of creative abilities and the formation of project thinking style. The relevance of the course is still that many young novice researchers still do not know enough about the methodology of scientific research, and this course directs them to the right direction introduction of scientific research.

This course is designed to develop skills for the introduction of scientific research in the context of which include the right choice of topic and the definition of its structural elements or content. The main content consists of the definition of the history and philosophy of science and education, the methodology of collecting materials and their analytical and critical processing. Definitions of goals and objectives and main approaches used in describing the content of the chosen theme.

**What is the main argument of your course?**

The main argument of RBL is that the students develop the art and skills of research methodologies by conducting research. The course provides a board overview of the essential process of research. The course will be focusing on problem formulation and statement of hypotheses and cover research design, data collection, analysis, reporting and interpreting.

**Why is it relevant, interesting or significant?**

The course will be interesting for young researchers and professionals, PhD students and master students, who are actively developing their research activity. The course provides the classification of different types of research designs available to the researchers. The students will learn how to design the study-plan. The course aims to formulate research proposals and the required steps to complete the research study.

**What is the course about?**

The course is about developing the necessary skills of a student to perform research of the highest quality with critical review of all sources of literature, experiment planning, conduction and post processing, obtaining data, discussion, interpretation and finally present in various formats to

	international journal and parts of the co – authored books.
Goals and Objectives of the Course in Terms of Competences and Skills	<p>The purpose of the course or discipline is to find an acceptable form of organization and conduct of scientific research, taking into account the core competencies of the chosen specialty and topic, as well as to develop research skills. Studying engineering disciplines, postgraduate students and young teachers. Could use the competence and skills of independent research work, get acquainted with the main forms of scientific research and modern methods of acquiring skills to search for scientific information on paper and electronic media, study and master the design stages.</p> <p>The objectives of the course consist of forming an idea of the main directions of research work, actualizing the necessary skills of philosophical and abstract thinking, solving the problems of processing the accumulated data and materials, inculcating the necessary skills and abilities to solve specific problems in the scientific activity of postgraduate and graduate students.</p> <p>Using graduate students' ideas in theory, existing approaches, facts and other broad research topics. Develop, for example, problem solving skills, creative skills, communication skills, etc.</p> <p>As a result of the course, respondents will be able to define the topic of their scientific research, expand their knowledge and outlook on the theory and practice of scientific research, and define the conceptual apparatus, topics of their scientific research.</p>
Learning Outcomes	<ul style="list-style-type: none"> <li>➤ mastering modern engineering and information technology problems;</li> <li>➤ the ability to draw up a plan or a program of prospective studies from the choice of direction to its completion, use standard and</li> </ul>



	<p>popular methods of mathematical processing of experimental data, use various sources of information, use them in assessing the results of design and use, find creative solutions in the field of professional tasks;</p> <ul style="list-style-type: none"> <li>➤ possession of legal and ethical standards in predicting and assessing the consequences of their professional activities, skills in using modern technical information technologies to collect, process and disseminate scientific information in the field of engineering, information and related industries;</li> <li>➤ acquiring abilities for the professional operation of modern engineering, technical and computer equipment and scientific instruments by the ability to improve and develop their intellectual and cultural level in the field of engineering;</li> <li>➤ the ability to conduct such empirical studies as observations, description, comparisons, counting, measurements, questionnaire and others.</li> </ul>
Structure and Tasks of Independent Studies	Tajik Russian and English languages
Recommended Literature	<ol style="list-style-type: none"> <li>1. Research Methodology. Concepts and cases. Deepak Chawla. Neena Sondhi/ India 2016</li> <li>2. Bordens, K. S., &amp; Abbott, B. B. (2013). Research Design and Methods: A Process Approach (9th ed.). Boston: McGraw-Hill.</li> <li>3. Devlin, A. S. (2006). Research Methods: Planning, Conducting, and Presenting Research. Belmont, CA: Wadsworth/ Thomson Learning</li> <li>4. Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International.</li> <li>5. Peters, C. A. (2001). Statistics for analysis of experimental data. Environmental engineering processes laboratory manual, 1-25.</li> <li>6. Puangpet Phakhang. The development of instructional in Mathematics of Mathayomsuksa III students using Research-Based Learning. Mahasarakham: Mahasarakham University.</li> </ol>
Course Prerequisites	Knowledge of Russian and English. Quite a high

	level of knowledge in the field of the problem under study. The finished course of a master's degree, study in a master's degree or in postgraduate study.
Audience Overview	Master's and postgraduate students of the faculties of telecommunications, the department of technology and the faculty of physics and technology.

## V. Course Plan and Workload

Topics/Modules	Contact Hours	Independent Hours
1. Introduction to Research Based Learning. Course goal and objectives.	3	4
2. The selection of a topic and the design of an overall research plan. Determining the state of research and the level of success achieved in the chosen direction (literature review).	4	4
3. Objects and methods of research in the field of the selected and studied problem. Characteristics and skills of conducting empirical research.	3	5
4. Mastering the rules for writing projects, reports, and dissertations. General outline of the course of scientific research. Basic concepts of research work	4	4
5. Evaluation of the research results obtained, forms of its presentation. Formation of findings and conclusions	3	4
6. Presentation of project results	2	8
<b>TOTAL</b>	<b>19</b>	<b>29</b>

## VI. DETAIL COURSE PLAN AND WORKLOAD

WEEKS	TOPIC TITLE	TOTAL HOURS	INCLUDING					
			Lectures	Practical (laboratory)	Assignments			Individual work of students
					Group	Individual		
1.	<p><b>Introduction to Research Based Learning. Course goal and objectives.</b></p> <p>Types of knowledge, the main features of scientific knowledge. The importance of acquiring scientific work skills to enhance professional qualities and qualifications in a chosen field of activity. The relevance and practical significance of the work. Concepts: subject. goal and tasks. Their interpretation and explanation. What is studying this subject? Defining the main goals and objectives of this course. The concept of research work and mechanisms for determining goals and objectives. The disclosure of the importance of the components of all research work is to determine the purpose and objectives of the study. The purpose of this course is to find acceptable mechanisms for developing the research competence of graduate students in the learning process and mastering the basic techniques for introducing scientific research for writing dissertations and scientific projects and, ultimately, preparing competitive specialists for the needs of the national economy of the republic. Warnings to prevent gross error, that is, adapt to the hypothesis and select only facts that satisfy it. Unity of purpose and versatility of tasks. Practical examples related to the definition of the subject and object of study.</p>	7	2	1	1	1	2	2.9 20-26 1.14 54-68
2.	<p><b>The selection of a topic and the design of an overall research plan. Determining the state of research and the level of success achieved in the chosen direction</b></p>	8	2	2	1	1	2	2.9 20-26

	<p><b>(literature review).</b></p> <p>Motivation for the choice of scientific research. The study of literature and the acquisition of skills to work with sources of information on electronic and paper media. Differences between basic and applied research. The role of ideologies, paradigms, hypotheses, and objective laws of nature and society in research. The mechanisms for the selection of topics and the basic requirements for drawing up a plan of scientific work. Determining the state of knowledge and the level of success achieved in the chosen direction. Search for answers to questions such as “What is the degree of knowledge of the topic?”, “How to draw up the degree of knowledge of the topic of dissertation research?”, “Why is it needed?”. Examples of a research plan in accordance with existing standards and the requirements of GOST for graduate students and other categories of scientists. Basic rules for working with literature and other sources of information. Processing, systematization of literature, electronic media, video materials.</p>								<p>1.14</p> <p>54-68</p>
3.	<p><b>Objects and methods of research in the field of the selected and studied problem. Characteristics and skills of conducting empirical research.</b></p> <p>Selection and justification of the research progress and the methods used. The structure and levels of scientific knowledge (empirical, theoretical, technical). Brief description of currently used analytical research methods. Empirical studies (observations, description, comparisons, counting, measurements, questionnaire survey). Theoretical research (historical, logical, analytical, modeling. Descriptions of research methods in the field of the chosen and studied topic. Induction and deduction, analogy and formalization. The principles of hypothesis construction and its significance for the further course of the research. Statement of the research problem and its formulation. Levels of problem</p>	8	2	1	2	1	2		<p>1.10</p> <p>7-22</p> <p>2.8</p> <p>12-43</p>

	statement research.Characteristic of empirical research, interconnected by other methods of introducing scientific research.Oral survey methods, questionnaires and analysis of collected materials. Principles and problems of research. Principle of assessment and recognition. Answers to questions about what means “well-structured and quantitatively formulated problems.” Weakly structured and mixed problems. Methodology for constructing problems.							
4.	<p><b>Mastering the rules for writing projects, reports, and dissertations. General outline of the course of scientific research. Basic concepts of research work.</b></p> <p>Importance of acquiring scientific work skills for improving professional qualities and qualification in a chosen field of activity. Rules for writing reports. General scheme of progress of scientific research. Relevance and practical importance of scientific work. Classification of cognition methods (by the level of cognition, by accuracy of predictions and by other functional features). The most important rule of writing reports and dissertations. The general scheme of the course of scientific research and the basic concepts of research work. Features of writing a project, including scientific. The key stages of the project are the search for answers to the questions "what?" and "why?". The rule of writing reports and dissertations. Dissertation is a scientific qualification work. Dissertation analysis. Basic recommendations on the specifics and rules of writing a dissertation. Basic conceptual apparatus of research work. The rule of compiling the author's abstract of the thesis. Compilation of the information directory. Selection of the scientific adviser.</p>	8	2	2	1	1	2	<p>2.1 53-72</p> <p>2.5 55-69</p>
5.	<p><b>Evaluation of the research results obtained, forms of its presentation. Formation of findings and conclusions.</b></p>	7	2	1	1	1	2	<p>2.4 40-55</p>

	Methods of statistical processing of experimental data. Interpretation of the results (tables, graphs, charts, etc.). Making conclusions. Presentation of a research project. Methods of forming conclusions. Criteria for evaluating the results of scientific research: objective, neutral and with sufficient completeness. Conclusions - this is something new and significant that makes up the scientific and practical results. The quality of the study is determined by the novelty, relevance of the theoretical and practical significance of the results obtained by the study. The main units of analysis of the quality of research. Criteria for assessing the theoretical significance of the study. Criteria for assessing the practical significance of the work. The contents of the output. Conclusion reflecting the main content of the work.							1.10 76-82
6.	Presentation of project results	10		2	6	2		
	<b>Total:</b>	<b>48</b>	<b>10</b>	<b>9</b>	<b>12</b>	<b>7</b>	<b>10</b>	

## Assessment and Feedback

### Overview of Assessment Principles

Assessment Tasks	Weighting (%)	Individual/Group	Assessment Methods
1. Assessment of the literature review	10	Individual	Discussion, questionnaire
2. Presentation of the student's research result	40	Group/Individual	Assessment of the content of the presentation
3. Final exam	50	Individual	Writing exam, computer testing

### Course Grading

Final exam with mark

### Student Feedback

Anonymous on-line surveys