International Journal of Advance Scientific Research
(ISSN – 2750-1396)
VOLUME 03 ISSUE 07 Pages: 86-90
SJIF IMPACT FACTOR (2021: 5.478) (2022: 5.636) (2023: 6.741)
OCLC – 1368736135

Journal Website: http://sciencebring.com/index.php/ijasr

Research Article

THE CONTENT OF THE "MIMO TECHNOLOGY" MODULE IN THE PROFESSIONAL DEVELOPMENT SYSTEM

Submission Date: July 16, 2023, **Accepted Date:** July 21, 2023,
Published Date: July 26, 2023
Crossref doi: https://doi.org/10.37547/ijasr-03-07-15

Zakirova F.M.
Professor, Dsc Of The In-Service Center For Retraining And Upgrading Of Staff Tashkent, Uzbekistan

Pozilova Sh.Kh.
Associate Professor, Phd Of The In-Service Center For Retraining And Upgrading Of Staff, Tashkent, Uzbekistan

ABSTRACT

The article reveals the features of the content of the training module "MIMO technologies" for advanced training courses for teaching staff in the direction "Radioelectronic devices and systems", which were developed on the basis of the implementation of the Erasmus + project "New study program in space systems and communications engineering - Spasecom" at the Industry Center for Retraining and advanced training of teaching staff at the Tashkent University of Information Technologies named after Al-Khwarizmi.

KEYWORDS

MIMO technologies, space systems and telecommunications, content, advanced training.

INTRODUCTION

In our country, the Law of the Republic of Uzbekistan "On Education" approved on September 23, 2020, PF-4947 of the President of the Republic of Uzbekistan dated February 7, 2017 "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan", PF-5 of August 27, 2019 "On the introduction of a system of continuous professional development of managers and pedagogues of higher educational institutions" No. 789, Decree No. PF-5847 of October 8, 2019 "On approval of the concept of development of the higher education system of the Republic of Uzbekistan until 2030" and No. PF-6097 of October 29, 2020 "On

International Journal of Advance Scientific Research
(ISSN – 2750-1396)
VOLUME 03 ISSUE 07 Pages: 86-90
SJIF IMPACT FACTOR (2021: 5.478) (2022: 5.636) (2023: 6.741)
OCLC – 1368736135

approval of the concept of development of science until 2030" and Decree of the Cabinet of Ministers of the Republic of Uzbekistan of September 23, 2019 "O Based on the content of priority tasks defined in the Decision No. 797 "On additional measures to further improve the system of training of managers and pedagogues of educational institutions, work is being carried out to improve the system of continuous training of pedagogues of higher education institutions.

From 2020, a new "MIMO technology" module has been introduced for professors and teachers of "Radioelectronic devices and systems" educational directions and specialties based on the specific features of the retraining and professional development direction and current issues.

The content of this module was developed on the basis of the Erasmus+ "New study program in space systems and communications engineering - Spasecom" project. Since November 15, 2019, the Spasecom project has been carried out at the network center for retraining and professional development of teaching staff of higher educational institutions under al-Khorazmi Tashkent University of Information Technologies. The project "New study program in space systems and communications engineering - Spasecom" (609715-EPP-1-2019-1-UZ-EPPKA2-CBHE-JP) is a project funded by the European Commission within the Erasmus+ program. Tashkent University of Information Technologies named after Al-Khorazmi is the grant holder of this project. The project consortium includes 8 higher educational institutions from five countries - Germany (Technical University of Berlin), France (Sorbonne University), Belgium (Antwerp University of Applied Sciences), Bulgaria (Sofia Technical University) and Uzbekistan: Tashkent University of Information Technologies named after al-Khorazmi, Karshi branch of Tashkent University of Information Technologies named after al-Kho-razmi, retraining and qualification of teaching staff of higher educational institutions under the Tashkent University of Information Technologies named after al-Khorazmi network center for development, Fergana Polytechnic Institute, Turin Polytechnic Institute in Tashkent, Tashkent State Tech-nical University, National University of Uzbekistan, Institute of Astronomy of the Academy of Sciences of the Republic of Uzbekistan.

Overall goal of the Spasecom project is to modernize existing training programs in the field of space systems and engineering communications.

The curriculum of the course "Advanced antenna and propagation concepts for 5G" presented by the foreign partners of the Erasmus+ "New study program in space systems and communications engineering - Spasecom" project was used to develop the content of the "MIMO technology" module. The purpose of the "MIMO technology" module is to improve the knowledge of the students of the "Radioelectronic devices and systems" training course about modern and promising mobile commu-nication systems, to develop the skills and competencies of identifying, analyzing and evaluating problems in this direction.

International Journal of Advance Scientific Research
(ISSN – 2750-1396)
VOLUME 03 ISSUE 07 Pages: 86-90
SJIF IMPACT FACTOR (2021: 5.478) (2022: 5.636) (2023: 6.741)
OCLC – 1368736135

The tasks of the "MIMO technology" module are defined as follows:

- studying MIMO technology, one of the innovative technologies in the field of mobile communication systems, and advanced foreign experiences;
- Ensuring the integration of training processes in the field of "Radioelectronic devices and systems" with science and production.
- The "MIMO technology" module is conducted in the form of lectures and practical exercises. In the process of teaching the module, it is envisaged to use modern practice-oriented methods of education and information and communication technologies:
- presentation and electronic didactic technologies using modern computer technologies in lectures;
- modern technical and software tools, project method, express questions, brainstorming, group thinking and other interactive educational methods are used in the practical training.
- The following teaching methods are used for this module:
- lectures, practical training (understanding of information and technologies, development of mental interest, strengthening of theoretical knowledge);
- roundtable discussions (increasing the ability to propose, hear, perceive and draw logical conclusions regarding the project solutions under consideration);
- arguments and debates (developing the ability to present evidence and reasoned arguments for the solution of projects, listen and find solutions to problems).

The article "New study program in space systems and communications engineering - Spasecom" (609715-EPP-1-2019-1-UZ-EPPKA2-CBHE-JP) project is published within the Erasmus+ program.

REFERENCES

1. Resolution No. 797 of September 23, 2019 of the Cabinet of Ministers of the Republic of Uzbekistan "On additional measures to further improve the system of training of managers and pedagogues of higher educational institutions".
2. Abdukadirov A., Davronbekov D. 4G generation of mobile communication systems. Study guide. - Tashkent, TATU - 2015. - 328 p.
3. M. A. Jensen and J. W. Wallace, "A review of antennas and propagation for MIMO wireless communications," in IEEE Transactions on Antennas and Propagation, vol. 52, no. 11, pp. 2810-2824, Nov. 2004. doi: 10.1109/TAP.2004.835272
4. E. G. Larsson, O. Edfors, F. Tufvesson and T. L. Marzetta, "Massive MIMO for next generation wireless systems," in IEEE Communications Magazine, vol. 52, no. 2, pp. 186-195, February 2014, doi: 10.1109/MCOM.2014.6736761.
5. H.Madaminov, U.T. Aliev. "Analysis of the problems and opportunities of the built-in satellite
6. and terrestrial iot networks in the conditions of the republic of Uzbekistan". Journal of

International Journal of Advance Scientific Research
(ISSN – 2750-1396)
VOLUME 03 ISSUE 07 Pages: 86-90
SJIF IMPACT FACTOR (2021: 5.478) (2022: 5.636) (2023: 6.741)
OCLC – 1368736135

Pharmaceutical Adverse Outcomes, Volume 13, Special Issue 10, 2022, P. 439-444.

7. Madaminov H., Khudaiberganov J. "Analysis of radio resource management process in mobile communication systems". "Descendants of Muhammad al-Khorazmi" Scientific-practical and information-analytical magazine. No. 3(21)/2022. - S. 172-179M.
8. Huebener, T. 1959. How to Teach Foreign Languages Effectively. New York: New York
9. University Press.
10. Potapov L. P. Materials on the semantic-related system among the Uzbeks of Kungrad //
11. Scientific Thought. - Tashkent, 1930. - No. 1. - p. 53-58.
12. Tursunoy, A. (2022). The role of problem education technologies in Learning process. Ta'lim va rivojlanish tahlili onlayn ilmiy jurnali, 2(7), 161-162.
13. Tursunoy, A. (2022). Priorities for learning a foreign language. Ijtimoiy fanlarda innovasiya onlayn ilmiy jurnali, 2(7), 34-36.
14. Tursunoy, A. (2022). Comparative analysis and lingo-didactic issues of Reported speech in uzbek and english languages. Barqarorlik va yetakchi tadqiqotlar onlayn ilmiy jurnali, 2(7), 62-64.
15. Tursunoy, A. (2022). Creating a warm and inclusive classroom environment: planning for all children to feel welcome. Ta'lim va rivojlanish tahlili onlayn ilmiy jurnali, 2(8), 142-144.
16. Nabievich, M. M., & Kholikovich, R. K. The Importance and Role of" Safety of Life Activities" Subject in Higher Educational Institutions. JournalNX, 9-13.
17. Rakhmonberdievich, Y. O., & Razzokov, K. K. (2022). Scientific Methods of Optimization of Labor Safety in Economic Sectors. European Journal of Life Safety and Stability (2660-9630), 232-237.
18. Rakhmonberdievich, Y. O., & Razzokov, K. K. (2022). Scientific Methods of Analysis to Improve Occupational Safety by the Sanitary and Hygienic Condition of Industrial Premises.
19. European Journal of Life Safety and Stability (2660-9630), 1-5.
20. Ahrorov, Z. O., & Sobirov, B. B. (2021). The Prospects Of The Development Of Extreme Tourism In Uzbekistan. Asian Journal of Management, Entrepreneurship and Social Science, 1(1), 146-152.
21. Sobirov, B. Development of demand on tourism services over innovative economic advancement conditions examples of Uzbekistan. Journal of Management Value & Ethics, 85.
22. Fayzullayeva, G., & Shukurova, N. (2021). O'qituvchi – o'quvchi munosabatlarida o 'qituvchining kommunikativ ko 'nikmalarini rivojlantirish. Integration of science, education and practice. Scientific-methodical journal, 215-217.
23. Sharipboyevna, G. F., & Mamadiyarovich, V. T. (2021). Pedagog-xodimlarning uzluksiz o 'qishini tashkil qilish va uning muhim jihatlari. Integration of science, education and practice. Scientific-methodical journal, 37-41.

International Journal of Advance Scientific Research
(ISSN – 2750-1396)
VOLUME 03 ISSUE 07 Pages: 86-90
SJIF IMPACT FACTOR (2021: 5.478) (2022: 5.636) (2023: 6.741)
OCLC – 1368736135

24. Sharipboevna, F. G., & Kamola, T. (2021). Improving cross-cultural Communication. ResearchJet Journal of Analysis and Inventions, 2(05), 359-363.