JOSIP JURAJ STROSSMAYER UNIVERSITY OF OSIJEK

FACULTY OF KINESIOLOGY OSIJEK

# Strategic Program of Scientific Research

## 2022- 2026

FACULTY OF KINESIOLOGY OSIJEK

JOSIP JURAJ STROSSMAYER UNIVERSITY OF OSIJEK

# STRATEGIC PROGRAM OF SCIENTIFIC RESEARCH 2022-2026

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In the development of the Strategic Program of Scientific Research 2022-2026 participated:

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2. Iva Šklempe Kokić, Assistant Professor, Ph.D., vice dean for science and international cooperation

3. Zvonimir Tomac, Associate Professor, Ph.D., vice dean for teaching

4. Tvrtko Galić, Assistant Professor, Ph.D., vice dean for development, professional work and business relations

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Content

## 1. INTRODUCTION

Faculty of Kinesiology Osijek is a part of Josip Juraj Strossmayer University of Osijek established for the purpose of scientific and teaching activities in the field of social sciences in order to educate competent staff to work in all areas of applied kinesiology. The Faculty of Kinesiology Osijek inherits the tradition of educating staff in the field of kinesiology, ie physical education in Osijek, which dates back to the last century. It was registered on August 3, 2020 at the Commercial Court in Osijek. The Faculty of Kinesiology Osijek received a work licence approved by the Ministry of Science and Education of the Republic of Croatia on September 11, 2020.

Scientific and teaching work of the Faculty of Kinesiology Osijek begins on October 1, 2020 in the academic year 2020/2021 acting as an independent component of the Josip Juraj Strossmayer University of Osijek. University undergraduate and graduate study programs are innovative and in accordance with the Bologna Declaration and European standards in higher education, and are tailored to the individual needs of students in acquiring competencies required in the labor market.

In the sports field of all levels of education in the Republic of Croatia, educated experts with adequate knowledge and skills in the field of kinesiology are needed to develop scientific research in applied kinesiology and be socially involved in sports and the development of a healthy society. The organizational values promoted by the Faculty of Kinesiology Osijek are knowledge, responsibility, identity, professionalism, flexibility, inventiveness, creativity and cooperation.

*The goal of the Strategic Program of Scientific Research for the period from 2022 to 2026 is to determine and present strategic goals and tasks that will be possible to implement in the next five year period, but also to obtain a permit to conduct scientific activities in the field of Social Sciences which would enable further development of the Faculty. Scientific research activity, in addition to the activity of higher education, is the basic purpose of the establishment of the Faculty of Kinesiology Osijek. In doing so, the Faculty will strive to improve the quality, domestic visibility and international visibility of its scientific research activities with the aim of generating new knowledge in the field of kinesiology and related disciplines.*

Achieving scientific excellence is based on strengthening the scientific and professional competencies of teachers and other staff, involving students in scientific work, connecting with the local community and institutions in the European Research Area and improving the research infrastructure of the Faculty through procurement of equipment, establishment of laboratories and expansion of spatial capacities. In the next five-year period, the goal of the Faculty is to position itself as a successful scientific institution operating in eastern Croatia and as a prominent component of the Josip Juraj Strossmayer University of Osijek in the European Research Area. Successful internationalization processes are necessary to

achieve scientific excellence in order to create preconditions for improving international visibility, mobility and cooperation with relevant scientific institutions from the country and abroad. The scientific institution always influences the life of the environment in which it operates, and the Faculty of Kinesiology Osijek will continue to improve existing and create new collaborations and partnerships at the regional, national and international levels. In its scientific work, the Faculty will support the local community and contribute new scientific knowledge to its environment through the transfer of knowledge and skills. Also, the scientific excellence of the Faculty will positively contribute to the quality of teaching conducted at the Faculty through the education of staff who will be more competitive in the labor market.

People who carry and implement processes are key to achieving strategic goals. Therefore, the competencies of the teaching and professional staff of the Faculty will be strengthened, excellence and rewarding in the processes of management, research, education and professionalism will be encouraged. The current method of financing does not allow the Faculty to plan and develop, so it is necessary to take care of finding other sources of funding and enable an effective response to changes in the environment. Obtaining a permit for performing scientific activities will enable the Faculty to be competitive and have greater opportunities to obtain funding, and thus achieve better results in teaching and research.

## 2. ESTABLISHMENT AND ORGANIZATION OF THE FACULTY OF KINESIOLOGY OSIJEK

*The Faculty of Kinesiology Osijek is a new component of the Josip Juraj Strossmayer University of Osijek, however, the tradition of educating staff in the field of kinesiology and physical education in Osijek dates back to the last century. From the recent history of training in the field of kinesiology, it should be mentioned that the Strategy of the Josip Juraj Strossmayer University of Osijek for the period from 2011 to 2020 stated the need to organize the study of Physical Education. Academic 2017/2018, classes began on the new undergraduate university study program Kinesiology at the Faculty of Education in Osijek. The graduate university study of Kinesiology Education was approved on February 28, 2018. At the initiative of the Rector of the Josip Juraj Strossmayer University of Osijek, Vlado Guberac, full professor, Ph.D., on September 25, 2019, a procedure was initiated to determine the justification for the establishment of the Faculty of Kinesiology in Osijek. At the session of the Senate of the Josip Juraj Strossmayer University of Osijek, held on May 27, 2020, a decision was made to establish the Faculty of Kinesiology in Osijek. At the session of the Senate of the Josip Juraj Strossmayer University of Osijek held on July 20, 2020, the interim dean of the Faculty of Kinesiology, Vesnica Mlinarević, full professor, Ph.D. was elected, and on July 7, 2021 at the Faculty Council of the Faculty of Kinesiology Osijek she was elected dean of the Faculty of Kinesiology Osijek and confirmed on July 13, 2021 at the Senate of the Josip Juraj Strossmayer University of Osijek.*

On August 3, 2020, the Faculty of Kinesiology Osijek was registered at the Commercial Court in Osijek. The Faculty of Kinesiology received a work permit approved by the Ministry of Science and Education of the Republic of Croatia on September 11, 2020. Teaching and scientific work of the Faculty of Kinesiology Osijek begins on October 1, 2020 in the academic year 2020/2021 acting as an independent component of the Josip Juraj Strossmayer University of Osijek.

Today, 201 students study at the Faculty of Kinesiology at the undergraduate university study of Kinesiology, 37 students at the part-time undergraduate university study of Kinesiology and 79 students at the graduate university study of Kinesiology Education. In the academic year 2020/2021, a total of 317 students studied at the Faculty of Kinesiology Osijek. The University undergraduate study program of Kinesiology and the graduate study program of Kinesiology Education are innovative and in line with the Bologna Declaration and European standards in higher education, and are tailored to the individual needs of students in acquiring competencies required in the labor market.

In the field of sports at all levels of education in the Republic of Croatia, educated experts with adequate knowledge and skills in the field of kinesiology are needed to be recognizable in the market and socially involved in sports and healthy society development as well as development of scientific research in applied kinesiology.

According to the Statute of the Faculty and the Regulations on the internal organization and systematization of employment positions at the Faculty of Kinesiology Osijek, the bodies of the Faculty are the Dean, the Faculty Council and other bodies provided by the Statute of the Faculty and other acts of the Faculty. The organizational structure of the Faculty is shown in figure 1. The structure of the Faculty management is shown in figure 2.

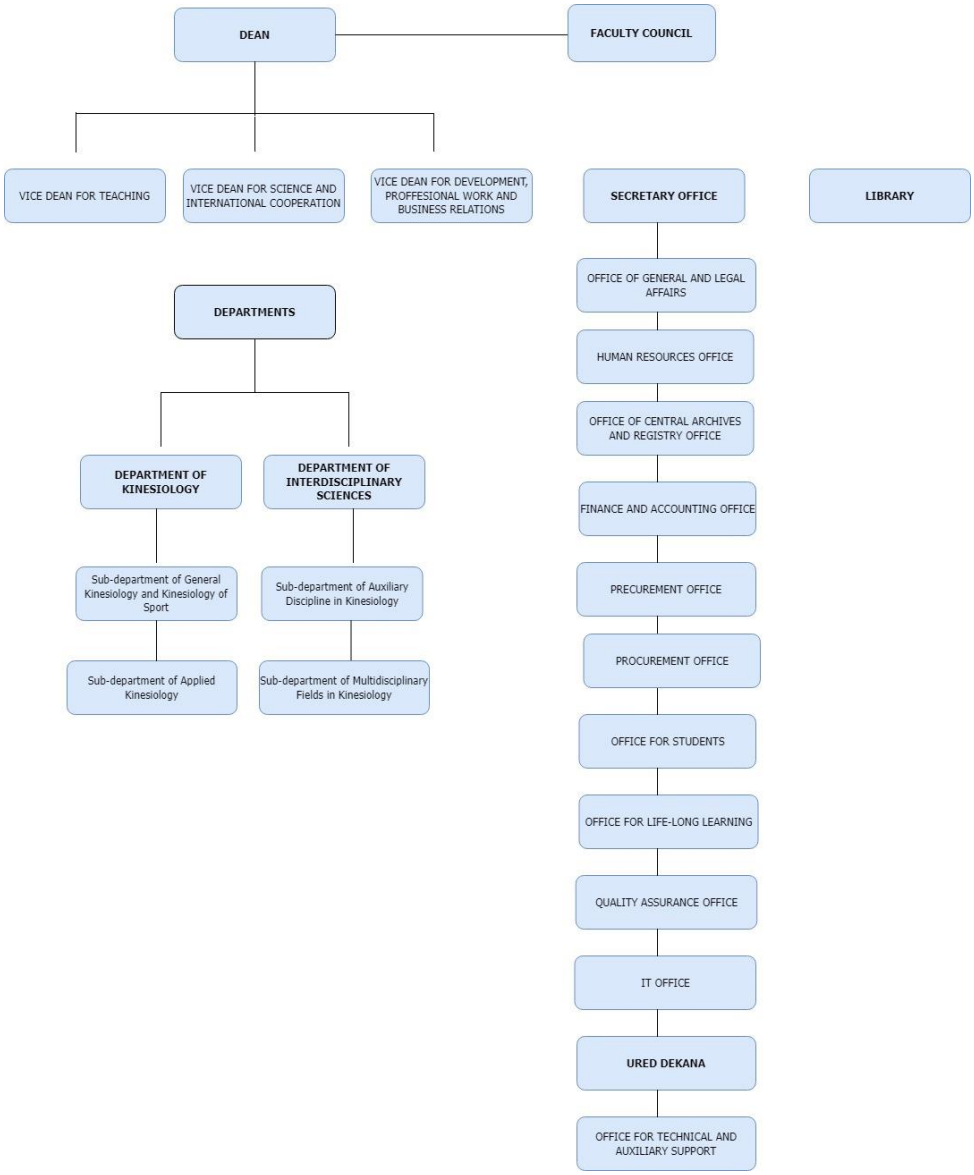


Figure 1. Organizational structure of the Faculty of Kinesiology Osije

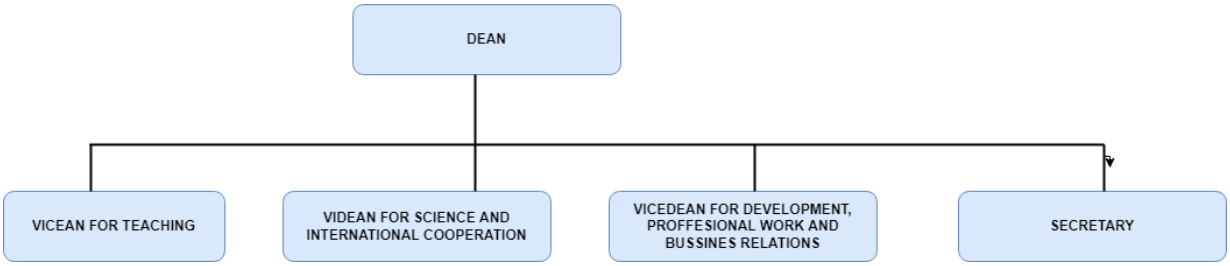


Figure 2. Management structure of the Faculty of Kinesiology Osijek

From the structure presented above, it is evident that the Faculty is managed by the Dean with three vice-deans and the Secretary of the Faculty. The Dean represents the Faculty, is its leader and has all the rights and obligations in accordance with the Statute of the University and this Statute. The Dean is responsible for the implementation of the statute and decisions made by university bodies at the Faculty.

The Faculty has 2 departments with 2 sub-departments, library and secretary office. The department is the basic organizational unit of the Faculty for teaching, scientific and professional work. A department as a basic organizational unit may be without lower organizational units or it may have two or more sub-departments.

The library is an organizational unit of the Faculty for performing library and information tasks and tasks related to teaching, scientific research and professional needs of the Faculty. The secretary office is an organizational unit for performing legal, professional-administrative, financial-accounting, quality improvement and assurance activities, tasks related to student issues, technical and assisting tasks at the Faculty and other tasks related to the successful work of the Faculty determined by this Statute and other general acts.


Today, the Faculty has a total of 39 employees, of which 1 full professor, 3 associate professors, 8 assistant professors, 5 assistants, 1 postdoctoral researcher, 2 lecturers, 2 senior lecturer and 17 administrative and support staff.

The Faculty Council consists of all full professors tenure, full professors, associate professors and assistant professors, one (1) representative of teachers elected to teaching positions, one (1) representative of associates elected to associate positions who have an employment contract at the Faculty, one representative of others employees who have a contract of employment at the Faculty and student representatives who make up at least 15% of the total number of members of the Faculty Council. The Dean and Vice-Deans are members of the Faculty Council by position. The Secretary participates in the work of the Faculty Council, without the right to vote. The Faculty Council holds its sessions, as a rule, once a month, and the sessions are chaired by the Dean.

The Faculty Council has standing committees:

- Committee for verification of academic advancement eligibility
- Committee for teaching and students
- Board for final bachelor and master theses

- Ethics committee
- Board for publishing activities
- Committee for monitoring and ensuring quality of higher education

The management structure ensures that students and employees participate in making important decisions at the Faculty. Students are also members of certain committees at the Faculty.

# 3. MISSION AND VISSION OF THE FACULTY OF KINESIOLOGY OSIJEK

## 3.1. Mission of the Faculty of Kinesiology Osijek

*The mission of the Faculty of Kinesiology Osijek is to enable the highest academic standards in scientific and teaching activities and to ensure that students acquire competencies in accordance with the needs of sports, society and national development.*

*We contribute to the development and social inclusion of creative and competent professionals, scientists and students in all fields of kinesiology and related scientific disciplines, respecting the needs of the labor market and society as a whole.*

*By cooperating with related domestic and international higher and public institutions, institutes and sports federations, the Faculty of Kinesiology Osijek promotes sports and encourages the advancement of teachers and students by joining the European higher education area through international cooperation and mobility programs for students, researchers and teachers.*

## 3.2. Vission of the Faculty of Kinesiology Osijek

*The Faculty of Kinesiology Osijek strives to improve the quality of higher education and will develop study programs, projects and lifelong learning programs in accordance with the needs of society and sports as global universal values.*

The Faculty of Kinesiology Osijek will strive for:

- creating new knowledge in the field of kinesiology, sports and related scientific disciplines based on the competence approach, learning outcomes and principles of lifelong learning.
- encouraging and strengthening an innovative interdisciplinary culture, encouraging excellence in research, the quality of higher education, especially in the academic and sporting achievements of students, respecting academic values and ethical principles.

*The Faculty of Kinesiology Osijek is the only higher education institution in the field of kinesiology in Eastern Slavonia that educates staff for all areas of applied kinesiology based on the latest scientific and professional knowledge. The Faculty bases its work on high academic and ethical values, on knowledge based on research and professional expertise, and on optimal infrastructural conditions. The Faculty of Kinesiology Osijek significantly contributes to the improvement of sports, sports recreation, physical and health education of pupils and students and the continuous improvement of the quality of active life and health of Croatian citizens.*

# 4. ANALYSIS OF THE SCIENTIFIC POTENTIAL OF THE FACULTY OF KINESIOLOGY OSIJEK

Scientific research is one of the basic activities of the Faculty of Kinesiology Osijek and directly contributes to the realization of the mission and vision of the Faculty, and indirectly to the realization of the mission and vision of the University. The structure of employees and the analysis of the current scientific research activities of the Faculty are presented below.

## 4.1. Employee structure

At the Faculty of Kinesiology Osijek, in the period of drafting the Strategic Program of Scientific Research for the period from 2022 to 2026, a total of 22 professors were employed, of which 12 full-time, 1 to 90% of working time, 1 to 70% of working time, 7 to 50% of working time and 1 to 20% of working time. The structure of employed professors is shown in Table 1.

Table 1. Employed professors in accordance with their title

| Title of the employees | Number of employed professors |
|---|---|
| Scientific-teaching title | 9,9 |
| Associate title | 5 |
| Teaching title | 2,4 |
| TOTAL | 17,3 |

The structure of employees in scientific-teaching positions is shown in Table 2.

Table 2. The structure of employees in scientific-teaching positions

| Scientific-teaching position | Number of employed professors |
|---|---|
| Full professor-tenure | 0 |
| Full professor | 0,9 |
| Associate professor | 2 |
| Assistant professor | 7 |
| TOTAL | 9,9 |

Out of a total of 10 employees in associate and teaching positions, three have PhD. Two (20%) have been elected to a scientific title, so it is expected that they will be promoted to appropriate scientific-teaching titles. The structure of employees in associate and teaching positions is shown in Table 3. Also, a total of 6 employees are in postgraduate scientific study to obtain a PhD degree.

Table 3. Structure of employees in associate and teaching positions

| Associate-teaching title | Number of professors elected to scientific title | Number of teachers not elected to scientific title | TOTAL |
|---|---|---|---|
| Assistant | 0 | 4 | 4 |
| Postdoctoral researcher | 1 | 0 | 1 |
| Lecturer | 0 | 1,2 | 1,2 |
| Senior lecturer | 0,7 | 0,5 | 1,2 |
| TOTAL | 1,7 | 5,7 | 7,4 |

The structure of employees with regard to the field in which they were elected to a scientific title is shown in Table 4.

Table 4. The structure of employees with regard to the field in which they were elected to the scientific title

| Scientific field | Research associate | senior research associate | Scientific adviser | TOTAL |
|---|---|---|---|---|
| Social sciences | 7,7 | 1 | 0,9 | 9,6 |
| Humanities | 0 | 0,5 | 0 | 0,5 |
| Biomedicine and Health and Interdisciplinary Fields of Science/Arts (Kinesiology and Clinical Medical Sciences) | 1 | 0 | 0 | 1 |
| Technical sciences | 0 | 0,5 | 0 | 0,5 |
| TOTAL | 8,7 | 2 | 0,9 | 11,6 |

From the above data it is evident that the Faculty of Kinesiology Osijek with the number of employed scientists exceeds the minimum criterion prescribed by Art. 5. Ordinance on the Content of Licence and Conditions for Issuing Licence for Performing Higher Education Activity, carrying out a Study Programme and Re-accreditation of Higher Education Institutions (NN 83/2010) of 7 employed scientists in full-time employment, of which at least 3 are scientists in the scientific field for which permission is required. As can be seen from the data, the Faculty of Kinesiology Osijek meets the condition of a minimum number of employed scientists in the field of Social Sciences with a number of 9.6 employed scientists.

The Faculty also employs scientists from the fields of Humanities, Biomedicine and Health, Interdisciplinary Fields of Science / Arts and Technical Sciences.

Therefore, the Faculty of Kinesiology Osijek has a multidisciplinary character, which gives it a comparative advantage in scientific activities and development, as well as the possibility of engaging in interdisciplinary scientific research. Multidisciplinarity is particularly evident in Table 5, which shows the scientific fields in which employed scientists are selected.

Table 5. The structure of employees with regard to the area and field in which they were elected to the scientific title

| Scientific area | Field | TOTAL |
|---|---|---|
| Social sciences | Pedagogy | 0,9 |
| Social sciences | Kinesiology | 7,7 |
| Social sciences | Economy | 1 |
| Humanities | Philosophy | 0,5 |
| Biomedicine and Health and Interdisciplinary Fields of Science/Arts | Clinical medical sciences/ Kinesiology | 1 |
| Technical sciences | Mechanical engineering | 0,5 |

## 4.2. Analysis of previous scientific research work

*The analysis of previous scientific research work refers to the period from the founding of the Faculty to the time of writing the Strategic Program of Scientific Research for the period from 2022 to 2026. The analysis includes scientific publications and publishing activities of Faculty employees from the moment of their employment at the Faculty, scientific projects in which they participated after the employment at the Faculty, participation in scientific conferences and international mobility of Faculty employees. Also, the analysis of scientific research work includes inter-institutional and international cooperation of the Faculty. Balancing the workload of scientists in teaching and scientific research, increasing motivation and commitment to solving problems in the environment as well as establishing a formal system of scientific research are key prerequisites for improving scientific research.*

### 4.2.1.Scientific publications and publishing

In the period from the founding of the Faculty to the writing of the Strategic Program of Scientific Research, professors of the Faculty of Kinesiology Osijek published a total of 93 scientific publications, of which 22 papers were published in publications indexed in WoSCC and / or Scopus database. Out of a total of 22 papers indexed in one of these two databases, 12 papers were indexed in WoSCC and 15 in Scopus. The distribution of published papers by quartiles in WoSCC and Scopus databases is shown in Tables 6 and 7.

Table 6. Distribution of published papers by quartiles in the WoSCC database

| Total number of papers published in WoSCC database | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| 12 | 0 | 1 | 1 | 10 |

Table 7. Distribution of published papers by quartiles in the Scopus database

| Total number of papers published in Scopus database | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| 15 | 0 | 3 | 3 | 9 |

Also, in the previous period, one scientific monograph was published, and the employees of the Faculty were members of editorial boards, executive editors and / or editors-in-chief in 9 publications.

### 4.2.2. Scientific research and professional projects

In the analyzed period, the Faculty of Kinesiology Osijek was not the holder of any scientific project because the majority of activities in the first year of the Faculty's existence were related to the organization of services and business, as well as the beginning of the university graduate study Kinesiology Education. Also, the Faculty is not yet accredited to perform scientific activities, which prevents access to domestic sources of funding such as the Croatian Science Foundation.

Despite these limitations, scientific project activity at the Faculty is present. Faculty from the academic year 2021/2022 participates in two COST actions: CA20104 - "Network on evidence-based physical activity in old age" and CA 19115 - "Network for blood pressure research in children and adolescents". Also, from the academic 2021/2022 the Faculty is a member of "The European Network for the Support of Development of Systems for Monitoring Physical Fitness of Children and Adolescents" (FitBack project, 613010-EPP-1-2019-1-SI-SPO-SCP) funded by Erasmus + Sport Collaborative Partnership scheme of the European Union.

*Employees of the Faculty in the analyzed period were active in a number of other projects, of which the following can be singled out: "Competence standards of teachers, pedagogues and mentors" (University of Zadar, UP.03.1.1.03.056), "Management model in terms of individual and small-batch production" (University of Slavonski Brod), "Simple cybernetic-physical educational-research model (Josip Juraj Strossmayer University of Osijek, UNIOS-ZUP 2018-103), "Impact of consumption of enriched chicken eggs (with omega-3 fatty acids, lutein, vitamin E and selenium) on vascular and endothelial function, oxidative stress levels and endothelial-leukocyte interaction in the athlete population" (Scientific Center of Excellence for Personalized Health Care, Josip Juraj Strossmayer University of Osijek, E-JEDN-52/2020), "Digital Tools and Methods for Safe Transfer Techniques for Caregivers in Today's Health Care Sector - STTech" (The Municipality of Aarhus, Aarhus, Denmark, Era smus + KA204 project 2020-1-DK01-KA204-075155) and "Science - society dialog Island Lab; Adriatic - Central Baltic Smart Innovation Clusters network" (European Committee of the Regions, Joint Research Center (European Commission).*

Also, the Faculty as a partner during the academic 2021/2022 applied for the following tenders for financing scientific projects: HORIZON-RIA, HORIZON-HLTH-2022-STAYHLTH-01 (project "OPTIMISE"), HORIZON-RIA, HORIZON-HLTH-2022-DISEASE-07-03 (project "MetaHealth for Youth") and ERASMUS-SPORT-2022-SSCP (project "Walk in pairs: Physical activity to improve health and inter-generational and inter-national cohesion").

Furthermore, the Faculty in the academic 2021/2022 launched the first tender for institutional research projects with its own funding. A total of 11 institutional scientific projects were approved, each of which was financed in the amount of HRK 5,000.00, and the estimated duration of the projects is one year. It is also planned to continue funding institutional research projects. The list of institutional research projects is shown in Table 8.

Table 8. Institutional scientific projects of the Faculty of Kinesiology Osijek

| Number of the project | Name of the project | Project label |
|---|---|---|
| 1. | Relationship of physical activity and lifestyle with certain parameters of health and quality of life | SciKifos2022-001 |
| 2. | Fist grip strength as a predictor of certain clinical indicators | SciKifos2022-002 |
| 3. | By bike through 360° | SciKifos2022-003 |
| 4. | Virtual reality and tactics | SciKifos2022-004 |
| 5. | Anthropological profile of futsal referees | SciKifos2022-005 |
| 6. | Impact of the COVID-19 pandemic on motor skills | SciKifos2022-006 |
| 7. | Mens sana in corpore sano | SciKifos2022-007 |
| 8. | Physical exercise to improve and preserve psychophysical health | SciKifos2022-008 |
| 9. | Monitoring the heart rate of top futsal players during the competition | SciKifos2022-009 |
| 10. | Differences in the strength of the lower extremities of girls and boys soccer players | SciKifos2022-010 |
| 11. | Construction of a new model for evaluating performance in team sports | SciKifos2022-011 |

### 4.2.3. International and domestic conferences

In the analyzed period, the Faculty of Kinesiology Osijek was a co-organizer of two scientific conferences: 4th Osijek Days of Bioethics (Osijek, November 8 and 9, 2021) and 3rd International Conference "Ethics, Bioethics and Sport" (Zagreb / Varaždin, April 1 and 2, 2022). In order to improve the quality of study and encourage scientific activity at the Faculty of Kinesiology Osijek, on May 24, 2021, the Scientific Colloquium "Physical Exercise, Society and Health" was held. The aim of the scientific colloquium was to exchange experiences, cooperation and encourage professors and students of the Faculty of Kinesiology Osijek to scientific research and scientific cooperation.

The participation of professors in international and domestic scientific conferences is encouraged and financed by the Faculty. A system of internal financing has been developed. Employees of the Faculty of Kinesiology in the analyzed period actively participated in 24 domestic and international scientific and professional conferences. Also, they were members of four program committees, one executive and one organizing committee of the conferences held.

### 4.2.4. Inter-institutional and international cooperation

The Faculty of Kinesiology Osijek is a new higher education institution and internationalization and international mobility is of exceptional importance. Seven bilateral agreements on cooperation with higher education and scientific institutions abroad were signed. The list of institutions with which an agreement has been signed can be found in Table 9. Also, seven Erasmus + agreements for the mobility of students, teachers and non-teaching staff have been signed (Table 10). In the past period, the Faculty employees achieved 6 outgoing mobility through the Erasmus + program. The Faculty hosted an incoming teacher mobility through the Erasmus + program. Three outgoing student mobilities were also achieved.

Table 9. Bilateral agreements on cooperation of the Faculty of Kinesiology Osijek

| | Institution | Place | Date of the agreement |
|---|---|---|---|
| 1. | University of Tuzla, Faculty of Physical Education and Sports | Tuzla, Bosnia and Herzegovina | December 17, 2021 |
| 2. | Ss. Cyril and Methodius University in Skopje, Faculty of Physical Education, Sport and Health | Skopje, Republic od North Macedonia | December 17, 2021 |
| 3. | Gdansk University of Physical Education and Sport | Gdanjsk, Poland | February 3, 2022 |

| | | | |
|---|---|---|---|
| 4. | Science and Research Centre Koper | Koper, Slovenia | February 18, 2022 |
| 5. | University of Niš, Faculty of Sport and Physical Education | Niš, Serbia | January 25, 2022 |
| 6. | University of Sarajevo, Faculty of Sports and Physical Education | Sarajevo, Bosnia and Herzegovina | February 8, 2022 |
| 7. | University of Belgrade, Faculty of sport and physical education | Beograd, Serbia | March 3, 2022 |

Table 10. Signed Erasmus + agreements for mobility of students, teachers and non-teaching staff

| | Institution | Place | Agreement period |
|---|---|---|---|
| 1. | University of Pécs, Faculty of Sciences | Pecs, Hungary | 2022-2027 |
| 2. | Euro-Mediterranean University (EMUNI) | Piran, Slovenia | 2022-2027 |
| 3. | Ss. Cyril and Methodius University in Skopje, Faculty of Physical Education, Sport and Health | Skopje, Republic of North Macedonia | 2022-2027 |
| 4. | Gdansk University of Physical Education and Sport | Gdanjsk, Poland | 2022-2027 |
| 5. | University of Ljubljana, Faculty of Sport | Ljubljana, Slovenia | 2023-2028 |
| 6. | Charles University, Faculty of Physical Education and Sport | Prague, Czech Republic | 2023-2028 |
| 7. | University of Niš, Faculty of Sport and Physical Education | Niš, Serbia | 2022-2027 |

## 5. COORDINATION WITH EUROPEAN AND NATIONAL STRATEGIC DOCUMENTS

Strategic program of scientific research of the Faculty of Kinesiology Osijek for the period from 2022 to 2026 is based on the SWOT analysis of the scientific activity of the Faculty of Kinesiology Osijek and the analysis of the scientific potential of the Faculty staff and is harmonized with the following European and national strategic documents:

- Strategy Europe 2020: European strategy for smart, sustainable and inclusive growth
- The National Development Strategy of the Republic of Croatia until 2030
- Strategy of Education, Science and Technology of the Republic of Croatia
- Strategic Plan of the Ministry of Science and Education 2020–2022
- Development plan for research infrastructure in the Republic of Croatia 2016
- European Charter for Researchers and a Code of Conduct for the Recruitment of Researchers
- Code of Ethics of Josip Juraj Strossmayer University of Osijek
- Strategy of Josip Juraj Strossmayer University of Osijek 2021 – 2030
- Strategy of sports development in Osijek 2020 – 2030
- Development Strategy of the Faculty of Kinesiology Osijek 2022 - 2026

## 6. SWOT ANALYSIS

For easier determination of tasks that need to be fulfilled in order to achieve the goals of the Strategic Program of Scientific Research of the Faculty of Kinesiology Osijek for the period from 2022 to 2026, a situational or SWOT analysis of the scientific activity of the Faculty was made. The very name of the analysis comes from the initial letters of the English words for Strengths, Weaknesses, Opportunities and Threats. The analysis of strengths (S) and weaknesses (W) represents the internal analysis of the Faculty, while the analysis of opportunities (O) and threats (T) represents the analysis of the environment in which the Faculty operates.

The aim of the SWOT analysis of the Faculty's scientific activity was to identify ways to achieve the use of the Faculty's strengths, while minimizing weaknesses and at the same time enable the Faculty to use its opportunities and reduce existing or expected threats from the environment to achieve scientific excellence and realisation of the Strategic program of Scientific Research of the Faculty of Kinesiology Osijek for the period from 2022 to 2026. The SWOT analysis is shown in Table 11.

Table 11. SWOT analysis of the scientific activity of the Faculty of Kinesiology Osijek

| | INTERNAL FACTORS |
|---|---|
| S - STRENGTHS | • Motivation of professors for scientific work and good cooperation between departments<br>• Financing institutional research projects and including students in them<br>• Encouraging applications for project proposals to external funding sources<br>• Funding attendance at scientific conferences<br>• Attractiveness, topicality and interdisciplinarity of the research area |
| W - WEAKNESSES | • Lack of accreditation for performing scientific activity<br>• Lack of references and necessary experience in obtaining and managing scientific projects and lack of project office<br>• Insufficient visibility and recognizability in scientific research<br>• Lack of scientific staff<br>• Insufficient inter-institutional cooperation with research teams and research institutions in the country and abroad<br>• Insufficient research equipment and spatial infrastructure |

| | EXTERNAL FACTORS |
|---|---|
| O - OPPORTUNITIES | • Lack of a competitive institution in the eastern part of the Republic of Croatia that performs scientific activity in the field of kinesiology<br>• Great potential for interdisciplinary research that can be realized with other components of the University and the local community<br>• Possibility of realization of inter-institutional cooperation with other stakeholders from the country and abroad who perform scientific activity in the field of kinesiology<br>• Possibility to apply for tenders for scientific projects funded by the EU<br>• The potential of Croatian sports and tourism as a basis for creating scientific projects<br>• Growing awareness in society about the benefits of physical activity for the prevention of chronic non-contageous diseases and healthy growing up of children as a basis for creating scientific projects |

| | |
|---|---|
| T - THREATS | • Insufficient financing of scientific activity from the budget of the Republic of Croatia<br>• Extremely limited employment opportunities for scientists, especially attracting renowned scientists from abroad<br>• Pandemic situation with unpredictable epidemiological measures<br>• Negative economic trends and unstable geopolitical situation |

*The scientific activity of the Faculty is an area which, due to the short history of the Faculty, has yet to achieve its full realization, and in the next strategic period the expansion of scientific research productivity is expected. The reason for optimism are the strenghts that are manifested in a stimulating internal environment through the motivation of teachers for scientific work and good cooperation between departments, institutional support of scientific work in the form of institutional projects, involving students in scientific work on projects, encouraging applications for external funding and funding attendance to scientific conferences. The great strength of the Faculty is the attractiveness, but also the interdisciplinarity of the research area.*

*Weaknesses of the Faculty's scientific activity are manifested through the lack of permission to perform scientific activities, lack of references and necessary experience in obtaining and managing scientific projects at the national and international level, lack of office for projects and still insufficient visibility and unrecognizability of scientists employed at the Faculty of Kinesiology Osijek. Also, the lack of scientific staff is noticeable, ie the uneven distribution of scientific-teaching and teaching and associate staff. Furthermore, inter-institutional cooperation with research teams and research institutions in the country and abroad is still insufficient. One of the biggest weaknesses is the lack of research equipment and infrastructure for performing scientific research activities.*

Among the opportunities identified in the SWOT analysis, the non-existence of a competitive institution in the eastern part of the Republic of Croatia that performs scientific activities in the field of kinesiology was singled out. There is a great potential for interdisciplinary research that can be done with other components of the University and the local community, but also the possibility of inter-institutional cooperation with other stakeholders working in the field of kinesiology in the country and abroad. One of the most prominent opportunities is the possibility to apply for tenders for scientific projects funded by the EU in the capacity of holder or partner. Furthermore, the potential of Croatian sports and tourism, but also the growing awareness in society about the benefits of physical activity for the prevention of chronic non-contageous diseases and healthy growing up of children also creates opportunities for creating scientific projects.

The biggest identified threats are insufficient funding of scientific activities from the budget of the Republic of Croatia, but extremely limited employment opportunities for scientists, and especially the attraction of renowned scientists from abroad. The pandemic situation also poses a threat when conducting scientific research in which respondents participate due to the unpredictability of the situation and the introduction of epidemiological measures. Unfavorable economic trends in the form of inflation, ie potential stagflation and the possibility of a consequent increase in the price of energy and equipment, but also a very unstable geopolitical situation also pose a serious threat to the financial stability of the Faculty when it comes to financing scientific activity.

## 7. PRIORITY AREAS AND RESEARCH TOPICS

Priority areas of scientific research, as well as scientific topics included in the Strategic Program of Scientific Research of the Faculty of Kinesiology Osijek for the period from 2022 to 2026 are based on analyzed strategic documents at national and European level, Faculty development plans, interinstitutional cooperation, existing scientific projects and scientific interests of researchers employed at the Faculty. The Faculty of Kinesiology Osijek has defined 5 priority research areas in which scientific activity will be performed in the period from 2022 to 2026:

- Research area 1: Kinesiology of sport,
- Research area 2: Kinesiology Education,
- Research area 3. Kinesiological Recreation and Fitness
- Research area 4: Kinesitherapy and Adapted Physical Activity
- Research area 5: Interdisciplinary research in kinesiology

Within each research area, scientific topics are defined with a work program and objectives for each individual topic. The elaboration of research areas and research topics is given in the following subchapters.
These priority areas and scientific topics are not final, but are subject to changes and upgrades that will depend on the financial situation and improvement of the scientific infrastructure of the Faculty, the implementation of reported domestic and international scientific projects and cooperation with external stakeholders. The Faculty will encourage applications for international and domestic sources of funding for scientific projects, but also continuously work on improving the scientific structure, interinstitutional and interdisciplinary cooperation, as well as exploiting the scientific potential of employed researchers, increasing the number of employed researchers and strengthening scientific youth.

## 7.1. Research area 1: Kinesiology of sports

Scientific research work in sports kinesiology always combines several dependent procedures such as: setting the goal and hypothesis of a research project, selection of a sample of respondents and a sample of variables, measurement or testing, design and implementation of an experimental program, selection of data processing methods, interpretation of results and their application in certain areas of sports practice. The kinesiology of sports, as a scientific field, is definitely strengthened by the fact that all phenomena in it can be measured and that all phenomena in athletes can be influenced by programmed processes of exercise, learning and training. Higher education institutions engaged in research in the field of sports science and its application can only meet the challenge and the needs for the quantity and quality of knowledge and therefore they have the task of educating and training coaches and other professionals for sports, while sports bodies and institutions accept such staff as an important and indispensable part of the entire sports system.

*Research in the kinesiology of sports is important for the development of sports, sports results and sports activities, measuring and developing the abilities and characteristics of athletes and sports results, and preserving the health of athletes. This can significantly ensure the quality of work of all professional staff in the sports system and more successful implementation of transformation processes in certain monostructural, polystructural, complex and conventional sports branches and in the fitness training of athletes.*

This research should provide scientific support to the work of coaches and other professional staff in sports in achieving even better results, as well as higher quality of work in sports, especially in the field of selection procedures, programming and implementation of training procedures. The kinesiologist of the future should be a person who will be able to perform diagnostics, prognosis, programming, implementation and evaluation of the exercise process on a scientific basis. In order to have the greatest possible impact on the

sports system in Croatia, this research should be conducted in cooperation with sports institutions (Croatian Olympic Committee, sports federations, communities of sports associations, sports associations, etc.), and the results should be part of everyday practice on sports fields (sports clubs, sports coaches, etc.) or practical solutions with the help of which it would be possible to easily apply the achieved scientific knowledge in operational training practice. Requirements for professional staff in the field of top and competitive sports are dominated by knowledge of the process of sports preparation as a means of maximizing the sports performance of athletes and sports teams, which consequently leads to achieving top sports results and desired success.
Research will be conducted in laboratories and in the field by the activity of scientifically productive staff in cooperation with undergraduate and graduate students, external associates and stakeholders, but also collaborating institutions for an interdisciplinary approach to research topics.
The scientific topics to be explored within the research area are listed in the tables below.

Table 12. Scientific topic 1

| Title of the scientific topic:<br>Monitoring the heart rate of top futsal players during the competition |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>The analysis of previous research has identified only a few scientific studies on the topic of futsal, although only a few researchers have conducted a time analysis in motion in futsal; however, these studies were conducted more than ten years ago (1991) but were published only recently (Hernandez, 2001). Futsal is highly conditioned by anaerobic capacity and requires the level of the cardiovascular system at 85 and 90% of the individual's maximum heart rate, where maximum heart rate is reached in most matches. Using analysis of time, movement and heart rate monitoring, the goal of this scientific topic will be to examine the activity profile and physiological requirements associated with the physical exertion of professional futsal players during competitive matches. Using heart rate monitoring belts and in-game time tracking applications, the functional profile of the player and the physiological requirements of the highest level competition in futsal will be determined. The results of this research will provide a better understanding of futsal and the physical condition requirements of the competition.<br>The goal of this scientific topic is to compare the data of heart rate and time spent in the game with physiological consumption during the competition. |
| Expected scientific contribution and possible applications of research results:<br><br>The results of this research will help to better understand the requirements of futsal in competitive conditions. The analysis of the results will form new scientific knowledge about the volume of work during the competition at the highest level. With the help of these results, coaches will be able to adjust and plan their work in sports and raise the level of sports preparation to the optimal level. Functional player profiles will also be formed, which will enable further individual planning of physical condition preparation. |

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| Conditioning coaches will have a better insight into the functional requirements of this sport and will be able to adjust their development and prevention programs to the maximum optimization of sports form. |

Table 13. Scientific topic 2

| Title of the scientific topic:<br>**Differences in the strength of the lower extremities of girls and boys soccer players** |
|---|
| Theoretical framework, work program and goals of the scientific topic:<br><br>It is estimated that the relative risk of anterior cruciate ligament (ACL) injury in female soccer players is six times higher than in male soccer players. There was also an increased risk for female players over the age of 20 for ACL injury. After a severe injury or surgical intervention, the player must be optimally rehabilitated in order to be able to return to the level of activity prior to the injury. Testing the strength of the thigh muscles is a commonly used tool in sports medicine and was previously often considered the optimal assessment of outcomes after the rehabilitation process.<br><br>Functional movement tests, where attempts are made to replicate the forces an athlete experiences on a daily basis, should be included in assessing the patient's readiness to return to sports training. Some authors have reported a high correlation between muscle strength and functional testing to prevent ACL injury. With the help of a mobile dynamometer and applications for measuring sprint speed and plyometrics, possible differences between girls and boys who train football in U15 group will be determined.<br><br>The goal of the study was to determine indicators of strength of the lower extremities of female and male football players and their relationship to sprint speed and jump height. |
| Expected scientific contribution and possible applications of research results:<br><br>The results of this research will help to better understand the differences between female and male football players that have been very little researched so far. Women's football in Croatia is in its infancy and for this reason the number of studies on this topic is very small. The field of motor skills in women's football in Croatia, but also in the world has been very little studied. The data obtained from this research will expand the knowledge fund on this topic of motor skills, which has been little researched in practice, especially in the sample of girls. |

Table 14. Scientific topic 3

| Title of the scientific topic:<br>**Kinematic analysis of football kicks** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Movement analysis can have a significant impact on improving an athlete's performance. Kinovea is a motion analysis system used to measure kinematic parameters. The program |

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| allows the analysis of motion recordings without markers. Several studies have examined the reliability of the Kinovea program. A study by Puig-Divi et al. (2019) found a high correlation coefficient (ICC of 0.99-1.00; r = 1.0) of the Kinovea program in measuring the angles of a moving object. Kicks from place in football are performed at high speed in a small space and are suitable for kinematic analysis. The number and type of kicks is increasing every day and there is very little information on how to perform these kicks in the right way.<br>The goal of this research is to determine the reliability of the Kinovea program when analyzing the kinematic parameters of kick performance in football. The secondary goal is to define a minimum recording resolution for which high reliability is determined. |
| Expected scientific contribution and possible applications of research results:<br><br>This research would try to enable higher scientific productivity in the field of biomechanics using a cheaper and accessible system for kinematic analysis. The obtained results would be useful to coaches for more successful training of athletes in the field of kicks, and to scientists in gathering more information and papers that could be carried out using the Kinovea program. |

Table 15. Scientific topic 4

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| Title of the scientific topic:<br>**Does the different use of video technology define the level of acquisition of ski knowledge?** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>Video materials have been used as a teaching aid for many years (Hartman 2007; Ste-Marie et al., 2016). The use of video material in the teaching process enables monitoring, evaluation and correction of motor performance (Kok et al., 2018). The use of video material in the teaching methods of alpine skiers is one of the essential settings for easier acquisition of specific ski skills, and for the purpose of obtaining feedback on performance and correction of characteristic errors that occur during this process. Videos of ski elements are mostly recorded in such a way that the cameraman stands along the edge and at the bottom of the ski slope and records the performance of the skier moving towards it. That is the so-called traditional way of recording in 2D view. With the development and improvement of video technology, new devices were created that significantly improved the quality and capabilities of video recordings. One of the modern video devices that has become increasingly popular in recent times is the Gopro 360 max camera. This camera enables recording in motion and for 360°, i.e. 3D video display.<br>This research will be conducted with the goal of examining the difference in the contribution of the traditional and more modern way of recording skiing elements to the theoretical acquisition of specific skiing knowledge. The sample of respondents who will evaluate the quality of traditional and Gopro 360 max videos for three skiing elements will be students of the Faculty of Kinesiology Osijek. Before completing the video quality assessment test, the performance of ski elements with videos of traditional and Gopro 360 max recording modes will be explained to students. When completing the ski |

knowledge acquisition test, students will have the opportunity to access and select videos of their choice. Statistical data processing methods will be used to examine the difference and contribution of 2D video display compared to 3D video display during the theoretical acquisition of specific skiing knowledge by respondents.

Expected scientific contribution and possible applications of research results:

This research is expected to yield innovative scientific findings that will define the level of contribution of the application of different video technologies in the process of acquiring specific ski skills. It will be determined which form of video presentation facilitates the process of acquiring specific skiing knowledge for students, which will improve the teaching process in skiing. The obtained results of the study will be practically applicable in ski school programs and in seminars for ski teachers and demonstrators. It will provide guidance for conducting future experimental research studies. Several final and diploma theses will be produced, and at least two scientific articles cited in the WOSCC and SCOPUS databases will be published, along with active participation in conferences.

Table 16. Scientific topic 5

| Title of the scientific topic:<br>**Defining competitive parameters that represent the main success factors in top men's volleyball** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Success in modern men's volleyball depends on the small details that make the difference between winners and losers. Small details are most often the subject of notational analysis, which, in addition to the preparation of the match, is often used for analysis during the match as well. Through a detailed notational analysis of a large number of matches, it is possible to determine competitive parameters of success that largely show in which elements the differences between winners and losers are.<br>In their work, Laios and Kountouris (2004) found a high correlation between the points scored by the attack and the victories achieved. Several recent works have confirmed the positive correlation between a successful attack and victory (Drikos et al., 2019; Garcia-de-Alcaraz and Marcelino, 2017; Laporta et al., 2018; Oliveira et al., 2016; Stutzig et al., 2015 ). More recent research (Pena et al., 2013; Kountouris et al., 2015) found that more successful teams have better serve. In addition to the serve, a positive reception of the serve (Drikos, et al., 2019; Eom and Shultz, 1992; Papadimitriou et al., 2004) and an unforced error in the game (Drikos, 2018 and Florence et al., 2008) influence the final outcome of the match.<br>Not a single research on the influence of competitive parameters on success in men's volleyball has been done in post-pandemic competitions. The impact of the pandemic on sport is still being investigated, and the goal of this paper is to determine whether there are differences between competitive performance parameters before and after the pandemic. New insights would allow coaches to practice those technical and tactical elements that had the greatest impact on success at the post-pandemic men's European Championship. |
| Expected scientific contribution and possible applications of research results:<br><br>This research will provide new knowledge about the influence of different competition parameters on success in top men's volleyball, which will enable coaches to have better technical-tactical preparation for matches at the highest level. Also, the comparison of the results of this research with the previous one will provide information about the impact of the pandemic on the volleyball game. The obtained results will also benefit coaches in younger age categories so that they can train their athletes from an early age to have a high degree of efficiency of those elements that most influence success in that sport. |

Table 17. Scientific topic 6

Title of the scientific topic:

**The contribution of the use of different video technology to the level of adoption of skiing knowledge**

Theoretical framework, work program and goals of the scientific topic:

Video technology as an auxiliary teaching aid in the teaching process facilitates the process of acquiring and improving specific motor skills (Ste-Marie et al., 2016), and is manifested in the fact that it enables monitoring, evaluation and correction of motor performances (Kok et al., 2018). The use of video technology is an integral part of the program of organized field teaching in skiing for kinesiology students, courses for teachers and ski demonstrators, and is often used in ski school programs as well. Video recordings of skiing performances can facilitate and speed up the process of teaching and improving specific ski skills in a way that allows skiers to visually display their own performances, and with the analysis by ski experts, obtain precise feedback on structural analysis and correction of characteristic errors that occur. The traditional way of filming, which is most often used in the process of teaching and improving ski skills, is the 2D view, which is characterized by the recording of a skier moving towards the cameraman standing on the ski slope, while the 3D view using the GoPro 360 max device characterizes the recording of the skier in motion and in 360°. This research will be conducted with the goal of examining the contribution of the traditional and more modern way of recording ski elements to the practical acquisition and improvement of specific ski skills.

An experimental longitudinal research will be conducted for the duration of 7 days, i.e. 40 hours of skiing lessons at the field teaching in skiing of the Faculty of Kinesiology Osijek. Immediately before the implementation of the experimental research, the subjects will be tested to assess BMI, static and dynamic balance, as well as to assess movement coordination and explosiveness. The sample of respondents will be students of the Faculty of Kinesiology Osijek who will not have any previous skiing knowledge, and will be assigned to three research situations. The ski teachers will carry out the process of ski instruction for all three sub-samples in the same methodical order, with the fact that the process of teaching and improving skiing skills will be carried out in the first experimental group with the help of a traditional recording method, in the second group with the help of Gopro 360 max in motion recording mode, and in the third group will do a combination of using the traditional way and Gopro 360 max recording in motion. The research will be carried out at a skiing field teaching at the Faculty of Kinesiology Osijek, where skiing performances will be recorded and the video analysis will be done. After the end of the teaching process, three independent judges will use a Likert scale to assess the success of the performance of four ski elements in all three subsamples of respondents. Statistical methods of data processing will examine the objectivity and homogeneity among judges in the assessment of ski skills and the relationship between anthropometric characteristics, motor skills and the level of adoption of specific ski skills among all three subsamples of respondents.

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| Expected scientific contribution and possible applications of research results:<br><br>This research is expected to provide innovative scientific knowledge related to the specifics of acquiring ski skills. For the first time, an experimental research method will determine the contribution of the use of different video technology in the process of acquiring skiing knowledge, taking into account the previous level of anthropometric characteristics and motor skills of the subjects. The teaching process of field skiing lessons will be improved and the process of acquiring and perfecting specific skiing knowledge will be facilitated for students. The results of this study will provide valuable information and guidelines in practical application and further research in the teaching of alpine skiers and in the education programs of ski teachers and demonstrators. Based on the obtained research results, several final and master theses will be prepared, and at least two scientific articles cited in the WoS and Scopus databases will be published, along with active participation in conferences. |

Table 18. Scientific topic 7

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| Title of the scientific topic:<br>Functional abilities in athletes of different categories and sports |
| Theoretical framework, work program and goals of the scientific topic:<br><br>The structure of physical fitness includes optimal health, functional and motor skills, adequate psychological stability, high motivation, and morphological features. The term "functional abilities" mainly refers to aerobic and anaerobic endurance. Aerobic endurance is an important ability that is highly dependent on the quality and level of functioning of extremely important organic systems in the human body. First of all, the cardiovascular and respiratory-pulmonary systems. Analyzing the state of aerobic endurance is one of the most common areas of testing in kinesiology in general, and the results can be applied to the needs of physical and health culture, recreation, kinesitherapy or sports. Measurements in kinesiology can generally be divided into two large groups: laboratory measurements and field measurements. The analysis of the state of aerobic functional abilities is very often carried out by field tests due to the fact that field tests are regularly applied, require very little equipment, do not require special performance conditions and can be applied to very different population groups. For recreationists, and we can also include the student population for the most part, information on aerobic endurance shows partly the state of health, but also partly the state of fitness, that is, the ability to perform everyday tasks. People who access different forms of recreational physical exercise very often have a need to improve their general state of training, and in any case, the state of aerobic endurance should also be included in the variables of general training. |
| Expected scientific contribution and possible applications of research results:<br><br>Given the fact that functional abilities represent an important aspect in the equation of the specification of any sports and sports activity, the analysis of the functional abilities |

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| of athletes has proven to be one of the most important items in the entire training-competition process. The study will analyze functional abilities in different ranks of competition in different sports, in people of different ages, genders and qualities. The results of these studies will provide a detailed insight into the influence of functional abilities on success in individual sports, which as feedback can consequently positively affect the final success at the team and individual level. |

Table 19. Scientific topic 8

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| Title of the scientific topic:<br>**The relationship between the socioeconomic status of parents and the swimming skills of school-aged children and the evaluation of self-assessment of swimming skills** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>In order to reduce the possibility of drowning, especially among children, education of non-swimmers is provided. In order to be able to teach non-swimmers, it is necessary to do an initial test to determine the current status of the pupils. The standard test of swimming skills is carried out in a deep pool, where pupils demonstrate the level of knowledge acquired. In order to speed up the verification process, before the test, a self-assessment of swimming knowledge can be carried out through a questionnaire that consists of only two items, where the pupil declares positively or negatively about his swimming status and four more regarding the socioeconomic status of his parents. As part of the questionnaire, the criteria for swimming knowledge are described in detail so that the pupil has a clear picture of the required level of knowledge. The goal of this research is to determine the exact number of non-swimmers among 12-year-olds in Osijek-Baranja County, and to assess the reliability of pupils' self-assessment of swimming knowledge and the connection between parents' socioeconomic status and swimming knowledge. |
| Expected scientific contribution and possible applications of research results:<br><br>The scientific findings of this research, especially on the importance of self-assessment of swimming knowledge and socioeconomic status of parents, will contribute to a better understanding of the connection between the factors responsible for the level of success in motor learning, that is, teaching non-swimmers. |

Table 20. Scientific topic 9

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| Title of the scientific topic:<br>**Construction of a new model for evaluating performance in team sports games** |
| Theoretical framework, work program and goals of the scientific topic: |

The quality of individual and team performance in team sports games is not only directly related to the level of development of the entire potential of the athlete and the entire team, their current real quality, but also to the level of adequacy of the game tactics model of both teams, the level of coordination of the players, the coach's management of the game, the conditions of the competition, judging criteria and other external factors. Therefore, team sports games are characterized by interdependence between an individual athlete and/or the entire team and the head coach, as well as the behavior of the opposing team. The purpose and goal of the project includes the issue of the optimal selection of performance indicator variables in the context of different definitions of team sports.
Determination of player and/or team performance models will be done in two ways. The first is by measuring or evaluating all factors that have the greatest (important) influence on the quality of play of an individual player and/or team. At the same time, based on the use of tests and the obtained results, it is possible (using multiple regression analysis) to calculate beta weights, with which individual tests are weighted differently in the total sum of points. Another way is by evaluating the overall performance in the game. The overall performance in the game includes all the important factors of the real quality of the player, which are evaluated by experts using a certain system of criteria.

Expected scientific contribution and possible applications of research results:

An attempt will be made to define the components of success in individual team sports in order to be able to conclude with certainty what constitutes the model of success of athletes and/or teams in a particular sport. Differences in situational performance between individual age categories of athletes, differences by gender, level of competition, etc. will be observed. Based on the results of the research, the most important moments of the game will be defined and highlighted, focusing only on what is important. Such results will greatly help coaches to make strategic and tactical changes during and after the game to ensure victory for their team.

Table 21. Scientific topic 10

| Title of the scientific topic:<br>Motivational climate – a predictor of intrinsic motivation in water polo |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Physical activity and playing sports have many positive effects on the individual, both physical (health), cognitive, emotional and social. Therefore, it is very important to encourage children and young people to engage in sports activities, either by engaging in an independent (individual) activity, an individual sport or a team sport. Water polo can be defined as a team sport that represents a combination of swimming, ball throwing and martial arts. |

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| In order for children, young people, and adults to play sports, it is necessary, first of all, to motivate them to work and train. Motivation in sports is a topic often researched in order to find the most efficient ways to attract children and young people to actively engage in sports. We define motivation as something that moves us to a certain behavior and maintains that behavior, but also determines the direction of our behavior and its end. The motivational climate in the sports environment includes a number of factors that determine which goals the athlete should achieve and ways of evaluating and rewarding the athlete's achievements. According to previous research, patterns of motivational climate have an influence on the type of motivation among sportsmen and sportswomen, but also among students in Physical Education classes.<br><br>The goal of this research is to examine the relationship between the motivational climate, where we differentiate between the motivational climate aimed at learning and developing skills and the motivational climate aimed at demonstrating superior performance and results, with intrinsic motivation in water polo players. |
| Expected scientific contribution and possible applications of research results:<br><br>The shortcoming of this research is certainly the use of only questionnaires as measuring instruments, which means that there is a possibility of socially desirable answers, misunderstanding of some questions or simply lack of interest in solving the questionnaire and random circling of answers. In addition to this, the motivational climate, as well as intrinsic motivation, can be influenced by a number of other factors that are not included in this research, and some of them are: the coach's leadership style and the personality traits of each individual, and for future research it would be good to take into account these variables. As a contribution of this research, it is important to learn new facts about water polo as a sport that has not been researched as much in the Republic of Croatia. Likewise, this kind of research would contribute to the validation of the Intrinsic Motivation Questionnaire and the Motivational Climate Perception in Sports Questionnaire. |

Table 22. Scientific topic 11

| Title of the scientific topic:<br>Reliability and validity of the constructed 3D model in the Kinovea program |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>The goal of this research is to determine the reliability and validity of the constructed 3D model in the Kinovea program. Kinovea (Kinovea, 0.9.5) is a free French program that was created in 2009 as a motion analysis program and is available on the official website www.kinovea.org. The program enables measurement of distance, time, angles and semi-automatic tracking of the marked point, which defines the speed and distance traveled. Kinovea enables kinematic analysis of 2D models and was predominantly used for kinematic analyzes of only one plane. Several papers have established a high, almost perfect validity of Kinovea's program. Balsalobre-Fernández et al. (2014) found a high |

validity of the Kinovea program for measuring time spent in the air (r=0.997). Validity was tested with the Optojump Next system. Puig-Divi et al. (2019) compared the Kinovea program with the gold standard AutoCad. They found that the Kinovea program is valid for measuring angles at a distance of up to 5 meters. Jiménez-Olmedo et al. (2021) tested the validity of Kinovea's program for measuring back squat speed. They used a Chronojump linear force transducer for validation. The results of their research showed high validity (r=0.985-0.990) on all observed variables.
In this research, the subjects would perform a vertical jump that would be recorded with two cameras. One camera would be placed in the frontal and the other in the sagittal plane. The recordings would later be processed in the Kinovea program and the data analysis would be transferred to an excel table. The X and Y axes from the sagittal plane would constitute the X and Y axis in the 3D model, while the X axis obtained from the analysis of the second camera would serve as the Z axis of the new model. The coordinates obtained in this way would then be transferred to scilab-6.1.1. in which they would be processed in detail. While performing the vertical jump, subjects would wear the X-sens suit, which is used for 3D kinematic analysis. The validity of the new model obtained from the Kinovea program would be compared with the results of the X-sens system.

Expected scientific contribution and possible applications of research results:

New scientific knowledge about the validity of the 3D model obtained through the Kinovea program and scilab would enable a greater number of high-quality kinematic research. Given that no additional equipment is required to obtain a new model, they would enable the analysis of performance in real, situational conditions that often vary from those obtained in laboratories. Quality kinematic analysis can improve technique and reduce the risk of injury, which is one of the most important issues for professional athletes and recreational players. In addition to improving training, with this type of kinematic analysis, it would be possible to obtain information about the kinematic parameters of the best athletes in the world and thereby obtain the model characteristics of top athletes.

Table 23. Scientific topic 12

| Title of the scientific topic:<br>**Duration of tennis matches in younger age groups** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Classifying sports according to the criterion of structural complexity, we classify tennis in the category of polystructural acyclic sports with the use of rackets and balls. A large number of moving structures as well as the situation change during the playing of each point, game, set, and consequently the entire match. Therefore, it can be concluded that the success of a tennis player is determined by the level and structure of a large number of knowledge and skills, some of which can be measured and analyzed. From a physiological point of view, tennis can be classified as a sport that mainly uses alactic |

anaerobic energy, except during longer intense exchanges when the lactate component (energy obtained by glycolysis) is also used. The recovery time is usually enough to replace that energy aerobically. The reason for this is the ratio of activity to rest 1:1.7 to 1:3.5, the duration of points 3.5 to 10.2 seconds and the percentage of effective play 16-30% of the total time. The range of the average heart rate ranges between 140-160 b/min in trained men, and during long and fast changes HR reaches 190-200 b/min. The characteristics of working with younger age categories in tennis are certainly different from professional tennis, therefore all the parameters mentioned are certainly different, from the very size of the ball, dimensions of the court, scoring, etc.
The goal of this scientific topic is to determine the differences in the length of matches between boys and girls tennis players in younger competitive categories during competitive matches during official tournaments.

Expected scientific contribution and possible applications of research results:

The playing time recorded among boys and among girls of different age groups of 8, 10, 12 and 14 years can certainly provide valuable feedback on the characteristics of the tennis game itself in younger age groups. In addition to the length of the matches, many other factors that have an impact on performance and tennis technique in different populations will be determined. Therefore, the goal of this research project is to determine the length of average matches at a particular age, so that the training process itself can be focused on optimal sports preparation for the competition itself, without exaggerating the intensity and extent of training and competition.

Table 24. Scientific topic 13

| Title of the scientific topic: |
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| The effect of the number of frames per second on the reliability of Kinovea program: How many frames per second are needed for the speed of human movement? |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Motion recording based on set markers is considered the gold standard for quantifying biomechanical parameters of human movement (Drazan et al., 2021). Zult, Allsop, Tabernero, and Pardhan (2019) defined a three-dimensional (3-D) motion analysis system that includes multiple cameras and active (light-emitting diodes) or passive (retro-reflective) markers as the gold standard for kinematic gait analysis. The disadvantage of these systems is difficult portability, high price and logistical complexity. The above-mentioned problems led to the need to develop a new, cheaper method of motion analysis.<br><br>Kinovea® is a 2D motion analysis system that can be used to measure kinematic parameters. The program allows the analysis of motion recordings without markers, but by adding markers, the reliability of the program can be improved (Damsted, Nielsen and Larsen, 2015). Several papers have studied the reliability of the Kinovea program with different frames per second settings. In his work, Balsalobre-Fernandez (2014) determined a high interclass correlation coefficient (ICC=1.0) between two measures in the assessment of the time spent in flight when performing a vertical jump. In their work, they used 240 frames per second. Pueo, Penichet-Tomas and Jimenez-Olmedo (2020) determined a very high intraclass correlation coefficient of the Kinovea program for jump height (ICC=0.985) and for take-off velocity (ICC=0.985). Vertical jump was recorded at 60 frames per second. Puig-Divi et al. (2019) determined a high intraclass correlation coefficient and Pearson's correlation coefficient (ICC of 0.99-1.00; r = 1.0) of the Kinovea program in measuring the angles of a made object that was moving. The movement of the object was recorded at 30 frames per second.<br>The goal of this paper is to determine the influence of different frames per second settings on the reliability of the Kinovea program when running on a treadmill. The biomechanical parameters that would be observed are the angles between the lower leg and upper leg, forearm and upper arm, time parameters, and speed of movement. Several cameras with different recording settings will record subjects starting to run on a treadmill and gradually accelerating until they reach their maximum speed. Processing the collected materials will provide information on minimum recording settings that have high reliability when studying sprints. |
| Expected scientific contribution and possible applications of research results:<br><br>Defining a minimum number of frames per second when recording sprints with a high level of confidence would allow for validation testing with these settings. Constructing an inexpensive device with high reliability and validity would enable a greater number of kinematic analyzes of sprinting and running, which are one of the most common activities of recreational and professional athletes, and would enable improvement of efficiency and prevention of possible injuries arising from running. Also, it would enable a greater |

number of works that would transfer the acquired knowledge to running schools, which would result in better teaching of future athletes and recreationists about proper running technique.

Table 25. Scientific topic 14

| Title of the scientific topic:<br>**The influence of the non-swimmer training program on the level of specific anxiety of fifth grade non-swimmers in Osijek-Baranja County** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Swimming could be defined as a biotic movement to overcome space through water, and it includes keeping the body on the surface of the water and moving in a certain direction. Swimming is an activity that is included in cyclical monostructural kinesiology activities. The performance of the movement itself is generally simple, but as it is carried out in water, it is affected by interfering factors such as the laws of hydrostatics, hydrodynamics and kinematics. Teaching non-swimmers can start from an early age, and thus the positive influence of swimming can be used sooner. A child's first proper contact with water is crucial for further swimming or any other water activity.<br>Swimming has a great and irreplaceable influence on the development of a child, which is manifested in the morphological, functional, psychological, biomotor and intellectual development of a young organism.<br>According to the official data of the World Health Organization, about 370,000 people drown in the world every year, and over 50% of the total number of drowned people are people under the age of 25, and it is the third cause of death for children up to 15 years old.<br><br>In 2003, the Red Cross of the city of Osijek conducted research on a sample of 10,500 third-grade children in 186 primary schools in Slavonia and Baranja. It was determined that 60% of children of that age are non-swimmers. Research that was conducted in 70 elementary schools in Osijek-Baranja County and found that the percentage of non-swimmers after the survey was 33.95%, and after testing the swimming skills of the same respondents at the pools, it was 41.07%, which is an increase of 7.12%.<br>In every process of motor learning, including teaching non-swimmers, there are factors associated with success. Previous research in the field of teaching non-swimmers has dealt with the connection of external factors with success, while the connection of internal ones has been neglected, especially when it comes to anxiety in the training of non-swimmers.<br><br>The results of previous research show that children with a higher level of anxiety tend to have a greater fear of failure, worry about mistakes, poor performance and defeat, and that the environment will criticize unsuccessful sports performance, which results in negative social and self-evaluation. |

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| Since it is evident that the level of anxiety is one of the important factors for the success in teaching non-swimmers, our goal is to investigate how the program itself affects the level of anxiety in participants of non-swimmer lessons and whether the non-swimmer training program reduces the level of anxiety in fifth-grade children from Osijek - Baranja counties. |
| Expected scientific contribution and possible applications of research results:<br><br>The scientific contribution of this research is manifested in new knowledge related to the impact of anxiety on non-swimmer children during their teaching. The results will contribute to a better understanding of the impact of anxiety on success or failure in teaching non-swimmers. New knowledge will result in greater success when teaching non-swimmers. It will help in the creation of better programs for training non-swimmers, thereby increasing the safety of children and enabling them to have a higher level of quality of life. |

Table 26. Scientific topic 15

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| Title of the scientific topic:<br>**The influence of different recording resolution settings on the reliability of the Kinovea program** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>The development of modern technology has enabled various diagnostic analyzes in sports. Diagnostic analysis is one of the most important parts of sports preparation and rehabilitation. Biomechanical analysis is a part of diagnostics that studies forces and their effect on the human body (McGinnis, 2013). Kinematics, along with kinetics and electromyography, is a subgroup of biomechanics that describes movement (McCaw, 2014). Motion recording based on set markers is considered the gold standard for quantifying biomechanical parameters of human movement (Drazan et al., 2021). Zult, Allsop, Tabernero, and Pardhan (2019) defined a three-dimensional (3-D) motion analysis system that includes multiple cameras and active (light-emitting diodes) or passive (retro-reflective) markers as the gold standard for kinematic gait analysis. The disadvantage of these systems is difficult portability, high price and logistical complexity. The above-mentioned problems led to the need to develop a new, cheaper method of motion analysis.<br><br>Kinovea® is a 2D motion analysis system that can be used to measure kinematic parameters. The program allows the analysis of motion recordings without markers, but by adding markers, the reliability of the program can be improved (Damsted, Nielsen and Larsen, 2015).<br>Several studies have studied the reliability of the Kinovea program in several observed parameters. In his work, Balsalobre-Fernandez (2014) determined a high interclass correlation coefficient (ICC=1.0) between two measurers in the assessment of the time spent in flight when performing a vertical jump. In the validity testing with the Infrared |

platform, the Pearson correlation coefficient showed almost perfect positive correlation (r=0.997). In their work, they used a camera with a resolution of 1,920x1080 with 240 frames per second. Puig-Divi et al. (2019) found a high intraclass correlation coefficient and Pearson's correlation coefficient (ICC of 0.99-1.00; r = 1.0) of the Kinovea program in measuring the angles of a moving object. The movement of the object was recorded with a resolution of 1280x720px and 30 frames per second. Lee et al. (2019) compared the Kinovea program with the Vertec jump test and found a high intraclass correlation coefficient (ICC from 0.73 to 0.99) for all tests. In their work, they used a camera with a resolution of 512x384 with 240 frames per second. In their work, Freitas-Junior et al. (2020) determined a high intraclass and interclass correlation coefficient (> 0.88) for measuring the time spent in the air when performing a vertical jump. In their work, they used a camera with a resolution of 448x336 with 240 frames per second.
Several papers that studied the reliability of the Kinovea program did not specify recording settings that can significantly affect the reliability of the program itself. Part of the papers that stated the recording settings when determining the reliability of Kinove's program had a rather low resolution. The papers in which the reliability was almost perfect are the papers that had the highest recording resolution (Balsalobre-Fernandez, 2014 and Pueo, Penichet-Tomas and Jimenez-Olmedo 2020). No research has studied the impact of resolution on the reliability of Kinovea programs. The primary goal of this research is to determine the influence of different resolution settings on the reliability of the Kinovea program when analyzing the kinematic parameters of vertical jump performance. A secondary goal is to determine the impact of different resolution settings on the reliability of the Kinovea program, but from different distances. The third goal is to define the minimum recording resolution for which high reliability is established. Defining the minimum recording resolution enables the use of cheaper video devices and thus enables cheaper kinematic analysis

Expected scientific contribution and possible applications of research results:

This work would determine the minimum recording resolution settings necessary to achieve a high level of reliability of the measuring instrument. Several papers have studied the reliability and validity of the Kinovea program, but none of them have determined the effect of different recording resolution settings on the reliability of the program. Without well-founded knowledge about the influence of recording settings on reliability, concrete knowledge about the validity of the program itself cannot be obtained. Defining the minimum recording resolution enables the use of cheaper video devices and thus enables cheaper kinematic analysis. A cheaper device for kinematic analysis would enable greater scientific productivity in the field of biomechanics, because until now biomechanical analysis could only be done with expensive equipment and in special biomechanical laboratories, which was not available to a large number of scientists.

Table 27. Scientific topic 16

| Title of the scientific topic: |
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| Evaluating results in sports |

| Theoretical framework, work program and goals of the scientific topic:<br><br>Bearing in mind the value and specificity of each sport, its technology, and the diversity of competition systems, but also the need to compare and evaluate achieved sports results using a unique measurement system, the creation of criteria for the evaluation of sports at the local, county, and even regional levels was stated as a need for more objective and better programming. This encourages the development of all kinds of sports and achieves the goals of increasing sports quality, mass and public interest. Respecting the fact that sports are of equal value, at least from the perspective of those who practice that sport, in every community one should try to create criteria for evaluating programs of public needs in sports without distinction. However, all sports that are more or less significant in potential evaluation are not in the same position. Material conditions, tradition, climatic peculiarities, citizens' affinities, market interest, etc. are just some of the factors of different development of certain sports, which is one of the basic conditions for ranking sports. Thus, the division of sports, i.e. the sports status table, does not result from the notion of sports as valuable and less valuable (each sport is the most valuable for the one who practices it), but from the real need for objective monitoring of the development of sports, both in any unit of local self-government and in Croatia, as well as internationally. |
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| Expected scientific contribution and possible applications of research results:<br><br>The expected contribution of science in the theoretical sense consists in defining the legality of the development of results in individual sports and sports disciplines, and analyzing the dynamics of results monitored at all levels of competition, achieved placements, comparison of different sports based on unique criteria. It strives to establish a unique sports system that can be applied equally at the local, regional and national level. On the basis of a unique evaluation system, it will be possible to compare teams and individuals from all over Croatia in the results achieved, regardless of the sport in which they participate. |

Table 28. Scientific topic 17

| Title of the scientific topic:<br>Evaluation of situational efficiency of goalkeepers in handball |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>According to the opinion of many handball experts, the goalkeeper is the player who most significantly determines the situational effectiveness and performance of his team (Rogulj, 2000). His technique and tactics and his isolation from other players make him a special part of the team. With his good defenses, he can contribute a lot to his team in order for it to be successful and win. Unlike the players in which the responsibility in attack is divided among six of them (when everyone is in the field), in defense, the responsibility when the ball goes towards the goal is only on the goalkeeper. Each goalkeeper (as well as his coach) must know himself well, his work habits, what suits him best or least so that |

he can adjust his training according to the opposing team and the level of competition. Goalkeepers differ in their technique and tactics. Different types of goalkeepers suit different opposing teams. That is why in each team we can see several different goalkeepers that the coach uses depending on the opposing team. There are usually two or three goalkeepers in the team. In addition to technique and tactics, they can also be distinguished by their morphological characteristics. In the past, goalkeepers were slower and larger, while nowadays goalkeepers who are more explosive and therefore lighter are more common. Also, there are goalkeepers who are more suited to certain shots, for example shots from outside positions, while others are more suited and better at defending shots from wing positions. Given that handball has accelerated and modernized, goalkeepers have also changed, as have their trainings. Today, it is almost impossible for a team not to have a goalkeeper coach, especially if it is a team that plays at a professional level. Unlike other playing positions, goalkeeper experience is also very important in handball. For goalkeepers, they often say the older the better, because experience brings them a lot of advantages, and we often see goalkeepers at the professional level defending until they are 40 years old. Although separated from the team in some way, the goalkeepers are still part of the team and cooperation between the team and the goalkeeper is important. One of the most common forms of cooperation is cooperation in defense, in which the goalkeeper and defenders agree to cover the corner when jumping into a block. In addition, cooperation must also exist when throwing a counterattack, a quick center and a quick throw in the ball. The goal of this scientific topic is to evaluate the situational efficiency of goalkeepers so that goalkeepers themselves evaluate individual elements of the goalkeeper's game based on their many years of experience through a survey. The emphasis is on evaluating the goalkeeper's defenses according to the criterion of the difficulty of the defense from different playing positions and from different situations. But there will also be questions about different situations during the match, playing with one less player, placing the goalkeeper, "viewing from the goalkeeper's angle".

Expected scientific contribution and possible applications of research results:

There are different systems for assessing the situational efficiency of players, goalkeepers and teams in handball. The need to evaluate the performance of individual players during the game can contribute to a better determination of the team's tactical activities. This scientific topic will give answers to the question of how important it is to place the goalkeeper well, whether changing the goalkeeper due to less players or a 7:6 game disrupts concentration, and whether there is a difference in the evaluation of situational efficiency by gender. It is assumed that every goalkeeper looks at different shots differently, regardless of gender, and builds and refines his technique accordingly.

## 7.2. Research area 2: Kinesiology education

In the field of kinesiology education, there are a number of subjects of study that are of significant interest to the kinesiology profession. The influence of physical exercise on health and on the development of anthropological features of children, pupils and students at all levels of the educational system is certainly singled out as one of the most important. Also, different models of acquiring motor knowledge and teaching methods are studied, which can contribute to the development of motor, functional abilities and conative traits as well as social status. Recently, the influence of the social environment on the physical and mental health of students and the inclusion of children with developmental disabilities in inclusive programs and the regular education system have been particularly emphasized. By determining the state of development of anthropological characteristics and understanding the impact of adequate physical exercise in the specific educational system, the social environment in which such forms of exercise are carried out, and the model of acquisition of motor information, it is possible to optimize kinesiology programs that realize transformational processes. Of course, the results of the study of such phenomena can indicate clear guidelines for work in the educational process at all levels.
The scientific topics that will be investigated within the research area are listed in the tables below.

Table 29. Scientific topic 18

| Title of the scientific topic:<br>**The connection between the physical activity of high school students and the social environment** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>In the world, the prevalence of physically inactive children is increasing every day, and Europe and the Republic of Croatia are no exception to this trend. The latest data indicate the fact that in the countries of the world, the percentage of girls aged 15 who are insufficiently physically active ranges from 78 to 95%, and from 71 to 90% for boys, while this value for the member states of the European Union ranges from 82 to 95% for girls, and from 72 to 89% for boys. In Croatia, at the age of 15, 88% of girls and 75% of boys do not spend at least one hour of moderate to submaximal physical activity per day. With an increasing number of children who do not meet the set recommendations of the World Health Organization on physical activity, the number of overweight and obese children is also increasing. In Croatia, according to the body mass index, 9% of girls and 24% of boys are overweight and obese.<br>The goal of this scientific topic is to determine the state and connection between indicators of the level of physical activity and social capital of young people in adolescence. Determining these relationships is important in order to learn about the influence of the social environment on the health of young people. |
| Expected scientific contribution and possible applications of research results:<br><br>Assessing the connection between social relations in the family, neighborhood and school with the level of physical activity of young people would enable the participants of the educational process to plan better and target the physical exercise content. The obtained results will direct future interventions so that as many young people as possible in adolescence, and even later in adulthood, reduce the potential risk of developing diseases of the cardiovascular system and metabolic diseases. Adolescence is the ultimate time for adopting healthy lifestyle habits, therefore the expected results of this research are intended to raise the awareness of young people and people from their environment about the importance of regular physical exercise and the quality of good interpersonal relationships for the purpose of long-term health preservation. |

Table 30. Scientific topic 19

| Title of the scientific topic:<br>**The influence of motor learning on the level of overall, skill-related anxiety** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Anxiety related to motor activity is specific compared to anxiety that is not related to motor activity. Anxiety has a negative effect on performance at different levels of management, on attention, on interpretation, but also on the physical and motor |

aspects. It also negatively affects familiarity with situations and decision-making. Furthermore, the feeling and perception of insecurity, anxiety and threat can interfere with both motor learning and motor performance. Children from the group with established anxiety exhibit impaired performance of motor skills and have a low level of self-assessment of peer acceptance and physical competence compared to non-anxious children. In their research, Skirbekk, Hansen, Oerbeck, Wentzel-Larsen and Kristensen (2012) found that as many as 19 children (46% of the sample) with established anxiety had results below the fifth percentile on the test that determines the motor performance disorder (M-ABC), indicating that motor function in anxious children is impaired to the extent that it interferes with their daily life activities.

Tuck jump is an element from the group of jumps that is associated with a high level of participants' anxiety. The learning of motor knowledge, in this study of the tuck jump, will be carried out during three 90-minute sessions according to the given protocol. Participants will fill out a questionnaire before the first term and before the third term of learning tuck jump. The level of adoption will be determined initially before the learning process and after the second and third terms, with grades from 1 to 5 (1 – the lowest level of adoption; 5 – the highest level of adoption). The survey questionnaire will also contain a statement that will examine the students' initial state of knowing how to perform a tuck jump. Participants will answer yes or no to the statement *I know how to perform a tuck jump*. Students who answered that they do not know how to perform tuck jump will receive a grade of 0 and their initial level of mastery will not be determined.
The main goal of the scientific topic is to determine the differences in the overall anxiety of the test subjects before and after learning the motor skills of performing a tuck jump. The partial goals refer to the determination of differences in the partial indicators of total anxiety and the determination of the relationship between anxiety and the learning outcomes of motor knowledge.

Expected scientific contribution and possible applications of research results:

The purpose of this research is to determine how the process of learning motor knowledge is reflected in the anxiety caused by the acquired motor knowledge, that is, whether intentional exposure to anxiety in controlled conditions can reduce it through adaptation processes. The contribution of the topic is the acquisition of new scientific knowledge about the process of motor learning, which could improve the quality of work during motor teaching.

Table 31. Scientific topic 20

| Title of the scientific topic:<br>Development of physical fitness in children of preschool age |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Physical fitness as well as cardiorespiratory functional abilities and muscle strength are indicators of the health of children and adolescents. By looking at the state of the |

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| mentioned components of health fitness in preschool children, it is possible to understand the connection of the functional abilities of the organism with the health status, but also with the development of motor and functional abilities as well as with some morphological characteristics. With the goal of determining the state of physical fitness of preschool children, the PREFIT battery of tests was developed to assess the fitness abilities of preschool children (3-5 years old). Physical fitness is a condition that allows an individual to perform everyday activities without fatigue. It is often associated with physical activity. It is a state that can change, adapt and vary, depending on the growth and development of the individual, as well as on the usual physical activities and lifestyle. Physical fitness has three basic components: muscular strength and endurance, cardiorespiratory endurance and motor ability (Malina, Bouchard & Bar-Or, 2004). In the last 40 to 50 years, research on the physical fitness of children and adolescents has largely focused on performance in various standardized motor tasks. The 10x4 meter test is used to assess turning speed, agility, and coordination. The test used to measure static balance is the test of standing on one leg, and the last test that is performed is the test for measuring cardiorespiratory fitness, the PREFIT 20m shuttle run. |
| Expected scientific contribution and possible applications of research results:<br><br>Health fitness with its cardiorespiratory and metabolic components has a direct impact on health, while the motor, muscle and morphological components affect the previous two components, as well as the quality of life. By developing physical fitness from the earliest, preschool age to the highest possible level, it is possible to prevent a premature decline in abilities. The contribution of this scientific topic is manifested in the detection of the current state of physical fitness of preschool children, as well as in the understanding of the connection between the physical fitness of preschool children and the current state of health, as well as functional and motor abilities, and the performance of motor skills. |

Table 32. Scientific topic 21

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| Title of the scientific topic:<br>**Methodical model of sailing training for people with intellectual disabilities** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>Recreational and regatta sailing has a long tradition around the world. In the last ten years, this type of activity has become more accessible to people with disabilities (Dabov and Berc 2013). A very small number of researches are focused on sailing, and in the field of sailing for people with intellectual disabilities, the number of researches is even smaller. One of the reasons for this lies in the fact that there is no adapted model of sailing instruction, and therefore the number of people with intellectual disabilities who engage in this activity is extremely small (there are no official data on the number of active sailors with intellectual disabilities). It has been scientifically proven that adaptation and an individualized approach in the training of any activity for people with intellectual disabilities is necessary. Previous research on the application of two different |

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| methodological training models was carried out by Oreb (1984) on the student population, and the results showed a significant difference in success.<br><br>The goal of this scientific topic is to determine a more effective model of teaching the basic elements of sailing technique to a sample of people with intellectual disabilities. Three models will be applied, which will differ in programmatic and material aspects. |
| Expected scientific contribution and possible applications of research results:<br><br>The results of this research will help sailing coaches in training people with intellectual disabilities. It will also enable more people with disabilities to participate in this type of activity for recreational or competitive purposes. |

### 7.3. Research area 3: Kinesiological Recreation and Fitness

Research in the field of kinesiology recreation and fitness is important for measuring and developing the abilities and characteristics of recreationists of different ages and genders. Such research can significantly ensure the quality of work of all professionals in the field of recreation and fitness, as well as the successful implementation of transformational processes in certain monostructural, polystructural, complex and conventional sports-recreational activities and various group and individual fitness programs. Such research is also aimed at evaluating the effects of different physical exercise programs on the physical and psychological status of individuals, athletes and recreational athletes, as well as investigating the effects of the application of specific intervention programs on improving sports performance.

Research in this area is based on the study of the effects of different group exercise programs on health and quality of life, and the evaluation of the effects of different methods of sports and recreational exercise programs on the physical abilities and mental health of individuals. This type of research also includes the prevention of various diseases caused by the modern way of life, as well as an insight into the possibility of the influence of physical exercise on the maintenance of the anthropological status and functionality of the movements of respondents of different ages.

Research procedures in kinesiological recreation will also be based on the interdependence of sports animation and other parts of tourist animation, which is extremely important for their further understanding and improvement. Prerequisites for the introduction of kinesiological recreation programs in different conditions and for different needs will be examined. It is planned to carry out research that will deal with the body composition of students, but also the connection between body composition and hand grip strength.

Innovative experimental scientific research on the applicability of virtual reality in encouraging people to engage in monostructural sports-recreational activity indoors is also

planned in this area. This would improve the quality of indoor training, thereby increasing the level of motivation and physical activity of individuals.

The scientific topics that will be investigated within the research area are listed in the tables below.

Table 33. Scientific topic 22

| Title of the scientific topic:<br>**The influence of different group exercise programs on the improvement and preservation of psychophysical health** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>In the fitness industry, an extremely large number of diverse group exercise programs are promoted, which are primarily focused on the development and maintenance of aerobic functional abilities, repetitive strength, coordination in movement and flexibility (Baron et al., 2020; Heidi et al., 2019; Zaletel, Gabrilo and Perić 2013). The diversity of group exercise program offerings enables a wide range of people with different anthropological characteristics, motor knowledge, training level and health status to participate in these programs with the goal of achieving a higher level of physical and health fitness and improving and preserving mental health (Xiang et al., 2017; Joon and et al., 2019). The modern development of the fitness industry has resulted in the creation and popularization of numerous group exercise programs, whose effects on changes in specific components of the anthropological status and psychological characteristics of individuals have not been sufficiently investigated. The main goal of the research will be to examine the impact of different group exercise programs on the anthropological status of the trainees, specific psychological constructs and their mutual relationship. Experts of group exercise programs and students of the Faculty of Kinesiology Osijek will be involved in the implementation of the research, and will implement the exercise programs. The experimental longitudinal research will be conducted in natural conditions for 8 to 12 weeks. The participants will be involved in three experimental situations, that is, three different treatments of group exercise programs that will take place twice a week. After initial testing, participants will be randomly assigned to research situations. Changes in dimensions of anthropological status, motor skills, functional abilities and some psychological aspects will be examined. The battery for the assessment of some dimensions of anthropological status will consist of basic and specific motor tests, tests for the assessment of functional abilities and anthropometry. From the psychological constructs, levels of depression and stress, various aspects of physical self-description (activity, physical appearance, coordination, endurance, health, strength, physical and general self-esteem) and positive and negative emotions will be monitored. After completing the experimental exercise programs, the participants will be finally tested. |
| Expected scientific contribution and possible applications of research results: |

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| This research is expected to provide new scientific knowledge about the influence of different group exercise programs in changing specific dimensions of anthropological status and psychological constructs. Effect size data will also be obtained with respect to specific group exercise programs. As an additional contribution, students will be educated on the construction, implementation and application of a modern battery of tests for the assessment of some dimensions of the anthropological status of individuals, motor skills and functional abilities of the participants. |

Table 34. Scientific topic 23

| Title of the scientific topic:<br>**The influence of yoga on changes in the posture of trainees and various aspects of body self-concept** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>The word yoga comes from the Sanskrit word "yuj" which means "to unite". It is a method of targeted and controlled exercises that activate muscle tone, mobility, flexibility, raise the quality of breathing and heart rate with an emphasis on proper posture and relaxation of the nervous system (Kalsha et al., 2012). Many papers point out the positive changes in the form of reduction of stress, anxiety and depression in trainees of targeted yoga programs. However, the existence of a large number of different yoga programs leads to problems in the interpretation of previous works and the impossibility of making more specific conclusions about the general impact of yoga on the body. This project plans to examine new scientifically based knowledge about the influence of yoga programs on the postural stability of trainees, in which meditation, asanas and pranayama would be carried out as an integral part of the eight-fold yoga path simultaneously, and most often they are part of a complete yoga class of almost every yoga program, specific psychological characteristics of the trainees and the influence of music on their mood and relaxation. It is planned to establish cooperation with the association for improving the quality of life and personal development Moksha in Osijek, and the research is planned to be realized by the end of 2022. An experienced leader of the yoga exercise program will be involved in the implementation of the research, and an experimental longitudinal study will be conducted under natural conditions lasting 8 to 12 weeks.<br><br>Respondents who voluntarily agree to the implementation of the research will be included in an experimental group yoga exercise program that will take place twice a week. A voluntary control group of subjects who will not exercise regularly is also planned to be included in the research. Participants will be introduced to the purpose of the research, which will include initial and final testing. Using the modern measuring device "Microgate Gyko", it is planned to measure the changes in the posture of the trainees. The battery for the assessment of some dimensions of anthropological status will consist of basic and specific motor and morphological tests, and a questionnaire will examine the influence and importance of the selected music in the experimental program. From the psychological constructs, levels of depression and stress, various aspects of physical self- |

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| description (activity, physical appearance, coordination, health, strength, physical and general self-esteem) and positive and negative emotions will be monitored. |
| Expected scientific contribution and possible applications of research results:<br><br>With this research, new scientific knowledge is expected about the magnitude of the effect of the yoga exercise program on the trainee's posture, motor skills, morphology and psychological aspects. The contribution of music to the level of relaxation of the trainees will also be examined. As an additional contribution, students will be educated about the construction, implementation and application of a modern battery of tests for the assessment of some dimensions of the anthropological status of individuals and the application of survey research. As part of the project, several final and master's theses will be produced. Based on the obtained research results, at least two scientific articles cited in the WoS and Scopus databases will be published, as well as active participation in conferences. Full dissemination of the results will follow in the year after the end of the project. |


Table 35. Scientific topic 24

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| Title of the scientific topic:<br>**The influence of group fitness programs on the anthropological characteristics of trainees** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>Group fitness is defined as exercise in which a group of people participates under the guidance of an instructor or fitness trainer (Wing, 2014). Group fitness programs are most |

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| often created from individual fitness programs because the content is applicable to a larger number of trainees. Trainees opt for group fitness programs because no prior knowledge of exercise is required, trainees fulfill the need for social contact and due to the influence of the environment, they are additionally motivated to come to training and fully commit to it, a variety of exercise aids are used, which additionally makes training interesting, exercises are exclusively made with music, any person can participate in group fitness programs regardless of age, gender, and level of motor and functional abilities (Meštrić, 2015). There are many different forms of group fitness programs, and they are divided into three basic groups: (1) aerobics and dance programs, (2) group resistance training and (3) Body and Mind programs - pilates and yoga (Bryant, 2011). In addition to the mentioned characteristics of group fitness programs, they also have other, no less important characteristics, which give them an advantage over other kinesiology activities that are carried out in real or simulated conditions, namely: improvement of health status, development of functional abilities, development of motor abilities, especially strength, flexibility, coordination and rhythm, strengthening of bone - joint and tendon segments of the locomotor system, shaping of individual muscle groups into a harmonious whole, as well as reduction of subcutaneous fat tissue. |
| Expected scientific contribution and possible applications of research results:<br><br>The criteria for evaluating the effects of the movement structures of different types of group fitness programs on the primary anthropological dimensions, from the first applications in the training of recreationists and athletes, are scientifically based and supported by numerous research results. Some types of these programs are primarily designed for recreational athletes, but increasingly aerobics, pilates or yoga also appear in the fitness training of top athletes and dancers. The goal of this scientific topic is to investigate the effects of the described types of group fitness programs on the development and improvement of individual fitness abilities of trainees of different ages, genders and quality. |

Table 36. Scientific topic 25

| Title of the scientific topic:<br>Sports animation programs in the Croatian tourist offer |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>The interconnectedness of sports and tourism, as two phenomena of today, represents a spatial framework for constant improvement and finding new opportunities for mutual action. An increasing number of families with small children are choosing hotels, camps and bungalows as their summer destinations, but in addition to food and accommodation, additional interesting facilities are also being sought after. As the awareness of the need to develop sports animation in summer resorts grows over the years in Croatia, so does the need for sports animators. Animation in tourism requires an interdisciplinary approach in working with guests, kinesiological activity as a natural need represents a very important segment of human life both in their everyday life and on |

vacation. Sports animators have the task of maintaining the kinesiological activity of tourists on summer vacation. Sports animators in their destination have the task of activating as many people as possible, teaching them certain motor exercises that are adapted to their knowledge, and encouraging them to have an active holiday in a sports and entertainment environment, while at the same time having a good time. The sports animator's program can consist of various elementary games, water games, various sports and sports tournaments. The task of the sports animator is to design and organize as many different motor tasks as possible, adapted to each age. The purpose of sports animation in the destination is to encourage guests to participate in sports activities, so that they can spend their vacation in an interesting, active and productive way.

Expected scientific contribution and possible applications of research results:

The main goal of this scientific topic is to show the specifics of the Croatian tourist offer in the context of sports recreation and animation. The basics of the interdependence of sports animation and other parts of tourist animation are presented, which is of great importance for the further understanding of the components of tourist animation. The differences between different sports programs in different age groups at different locations, as well as in facilities of different categorization, will be observed. The parameters of the influence of individual programs on the health status of the guests will also be looked at, as well as the overall satisfaction with all parts of the hotel offer.

Table 37. Scientific topic 26

| Title of the scientific topic:<br>**Improving the quality of sports and recreation facilities in tourism through educational swimming programs** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>In the current offer of animation and recreation programs in hotels, and especially in large hotel chains, the contents are mainly aimed at childcare under different names such as swimming schools and other sports facilities. I am of the opinion that quality educational swimming programs would greatly contribute to the quality of the hotel's tourist offer. According to the official data of the World Health Organization, about 370,000 people drown in the world every year, and over 50% of the total number of drowned people are under the age of 25, and it is the third cause of death for children under 15. The very fact that there is a large number of non-swimmers and an even larger number of people who are not sure of their swimming ability opens up a large space in the tourist offer in terms of swimming education. During the summer, a large number of activities are offered that require swimming skills, not only at the beginner level, but also at a high level. A quality offer is reflected in a good program that can combine all the requirements of a potential tourist. Likewise, individual swimming learning programs for adults in the areas of hotel pools that are not exposed to the public are one of the special features of the offer that is in line with the epidemiological measures caused by the COVID-19 pandemic. |

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| The goal of the research is to determine the representation of quality educational programs in the field of swimming in the tourist offer of hotels in Croatia and the surrounding area, and to offer and create new programs. The research will be conducted using a survey questionnaire that would contain questions about the representation of educational swimming programs in the hotel's current offer, as well as questions about possible interest in such a program. |
| Expected scientific contribution and possible applications of research results:<br><br>The scientific contribution is manifested in new knowledge about the current state of tourism as a basis for further research in that area and the creation of new programs. |

Table 38. Scientific topic 27

| Title of the scientific topic:<br>Physical activity and mental health of students at J. J. Strossmayer University of Osijek |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Physical activity is the cheapest and most accessible way for an individual to improve the quality of his life. The World Health Organization defines physical activity as a term that encompasses all movements in everyday life, including activity at work or school. In addition to numerous evidence that physical activity has positive effects on physical health, there are also studies that talk about the positive impact of physical activity on mental health.<br><br>The results of previous research suggest that physical exercise and other forms of recreation represent a very important factor in improving the overall psycho-physical condition of each individual. Anxiety and depression have proven to be one of the most common mental health disorders.<br>Stress represents a natural reaction of a person, which is a physical, mental or emotional response to a stimulus from the environment and causes a physiological imbalance in an individual. Since it motivates and encourages the best performance of tasks, stress can be positive, but it can also cause depression and reduce the individual's efficiency, which is the negative side of stress. We define anxiety as a psychological, physiological and behavioral state that has arisen due to some potential or actual danger. It is characterized by the fear of the unknown, and people do not know how to describe the true source of their fear. Furthermore, we define depression as an emotional state accompanied by a feeling of low mood and sadness. It represents a very unpleasant experience that gradually intensifies and is accompanied by various physical and bodily symptoms.<br>The goal of this research is to determine the prevalence of mental difficulties among students of J. J. Strossmayer University of Osijek and their connection with physical activity. |
| Expected scientific contribution and possible applications of research results: |

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| The results of this research provide us with data on the student population and their physical activity and impact on mental health. The results obtained in this way will give us a clear picture of the student population in general and a starting point for further research in the field of correlation between mental health and physical activity. |

Table 39. Scientific topic 28

| Title of the scientific topic:<br>**The influence of physical exercise on the morphological characteristics and movement function of elderly people** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>One of the goals of kinesiology, in addition to improving health and developing skills and knowledge, is to maintain them at the highest possible level during the deterioration caused by the aging of organism. Certainly, physical activity, and especially programmed physical exercise, contributes to the fulfillment of those goals that are not exclusively related to sports. Therefore, the goal of the topic is to study the impact of physical activity on some aspects of the anthropological characteristics of retirees, during which the changes and transformational processes that occur under the influence of planned and programmed physical exercise in adults will be valorized. Physical activity is ranked by intensity into moderately intense and highly intense. Also, according to the context, it is divided into physical activity at work (which does not only refer to paid work), physical activity in transportation/traffic, physical activity in performing household chores, house maintenance and family care, physical activity related to recreation, sport and physical activity in free time and time spent at rest.<br>The questionnaire will examine the types of activities that are carried out as part of everyday life, all through questions about the amount of time spent in carrying out a certain type of physical activity during the last seven days of the week. Functional assessment of movement is carried out with a standardized measuring instrument FMS (Functional movement screen), and is aimed at assessing the effectiveness of stability and mobility of the locomotor apparatus. Mobility and stability enable the locomotor apparatus to produce simple and complex movements without compensatory manifestations or pain. The functional assessment of movement consists of seven tests: deep squat (functionality and quality of movement of the whole body), hurdle step (balance), in-line lunge (coordination of lower and upper extremities), mobility of the shoulder, leg raises from a position of lying on the back (flexibility and mobility in the hip), push-ups (stabilization of the trunk) and rotational stability (stability of the pelvis, trunk and shoulder blades as well as coordination).<br>An OMRON BF 51 digital scale is used to assess some morphological characteristics (body mass, amount of muscle mass and fat tissue). A manual dynamometer is used to assess muscle strength, i.e. the maximum force produced by voluntary muscle contraction. The same procedure will be applied in the next quarter in order to gain insight into the impact of organized exercise on changes in motor skills and functional characteristics, as well as |

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| the relationship between them and the possibility of producing greater force and movement quality. |
| Expected scientific contribution and possible applications of research results:<br><br>Maintenance of motor and functional abilities and other qualities at the highest possible level can be achieved through adequate physical exercise. Understanding the impact of physical activity on anthropological characteristics is possible by monitoring changes in anthropological characteristics and evaluating physical exercise programs in a multi-month cycle. The results of the research will provide an insight into the possibility of the influence of physical exercise of elderly people on the maintenance of anthropological status and movement functionality. The connection between the level of physical activity and the anthropological characteristics of elderly people will also be determined. |

Table 40. Scientific topic 29

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| Title of the scientific topic:<br>**Correlation between the level of physical activity and morphological characteristics in the student population** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>Anthropometric characteristics can be an indicator of the state of health and the quality of diet and nutrition of the population, the field of research of anthropometric characteristics is becoming more and more widespread among researchers. It is also known that physical activity can affect the optimal composition of the body and thereby prevent the unnecessary accumulation of fat tissue and at the same time reduce the negative consequences of a sedentary lifestyle through the reduction of non-contagious diseases, especially those that damage the cardiovascular system. Thus, according to WHO recommendations, the most common indicators for assessing nutritional status are BMI (body mass index), body height in relation to age, body weight in relation to body height, body weight in relation to age. Recent research has shown a good correlation between BMI and total body fat content, that is, the percentage of fat tissue in the body (Cole, 2007). According to Behnek's two-component model, the composition of the body consists of lean mass (muscles, skeleton and internal organs) and fat mass, which is divided into "essential fat" (lipid components of cells) and non-essential fat (subcutaneous adipose tissue, bone marrow, visceral fat, etc.) ( Mišigoj – Duraković, 2008). Apart from this model, there are other models that define body composition differently. Thus, Malina, Bouchard and Bar-Or (2004) state a three-component model that, in addition to fat mass, divides lean mass into the total amount of water and lean dry mass, as well as a four-component model in which lean dry mass is broken down into bone minerals and residue. Of course, in addition to socioeconomic and dietary habits, body composition is also affected by energy consumption caused by physical activity. Physical activity can be defined as any activity caused by the activation of skeletal muscles, which through levers (bones), act on the environment and thereby increase the level of energy consumption above the resting level. Unlike physical activity, physical |

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| exercise with increased energy consumption consists of a plan and program, i.e. it has its own goal, purpose and individually adjusted load, i.e. the intensity and duration of the activity. Certainly, with organized physical activity, the composition of the body can be influenced in this way, i.e. increasing muscle mass and reducing unwanted fat tissue.<br>The goal of the research is to determine whether there are differences in the morphological characteristics of University students with different levels of physical activity. |
| Expected scientific contribution and possible applications of research results:<br><br>Adequate levels of physical activity can favorably affect body composition, especially in a certain volume of work when it is possible to develop muscle mass and reduce the proportion of fat tissue in the body. At the same time, only moderate to brisk and brisk physical activity, expressed in metabolic units, has a positive effect on health. The contribution of this research is reflected in the understanding of the impact of physical activity on some anthropological characteristics of adolescents and younger people, i.e. whether there is a connection between the level of physical activity and adequately developed anthropometric characteristics. |

Table 41. Scientific topic 30

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| Title of the scientific topic:<br>**The influence of virtual reality on motivation while riding a bicycle ergometer** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>Physical inactivity is considered responsible for 6 to 10% of chronic diseases in the world (Lee et al., 2023). The World Health Organization has classified physical inactivity as the fourth risk factor for mortality in the world (WHO, 2009). Accordingly, a global increase in physical activity levels can significantly improve the health of the general population (Lee et al., 2012).<br><br>One of the most common reasons for not meeting the required level of physical activity is a lack of motivation. A lack of motivation is often a byproduct of the monotony of exercise. One of the possible solutions is training with the use of virtual reality.<br><br>Virtual reality is a visually based computer simulation that can display a realistic and controlled environment (Akbas et al., 2019). Virtual reality can fool the predictive mechanism of the human brain and create a real sense of what is happening in virtual reality (Riva, Wiederhold and Mantovani, 2019). Stimulating a realistic environment can improve perception (Appelbaum and Erickson, 2018) and imagination ability (Ross-Steward et al., 2018).<br><br>Students and volunteers would use Gopro 360 max while cycling in Slavonia, and the video materials would be edited in the Da Vinci Resolve program afterwards. Edited video materials will be transferred to the respondents' mobile devices. Each examinee will place |

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| their cell phones in glasses designed for virtual reality. Once the subject has become accustomed to using virtual reality, they will begin exercising on a bicycle ergometer while wearing virtual reality glasses.<br><br>The experimental group would consist of subjects who would exercise on a stationary bike using virtual reality, while the control group would consist of athletes who would exercise on a stationary bike without virtual reality.<br><br>The exercise would be carried out for 12 weeks, during which each group would have to fulfill the subjective feeling of weight, motivation to exercise, feelings during exercise and their consistency in exercise. |
| Expected scientific contribution and possible applications of research results:<br><br>This research is expected to provide new scientific knowledge about the applicability of virtual reality in encouraging people to engage in physical activity. Also, students will be additionally familiar with driving activities in Slavonia and Baranja and will learn to use virtual reality as an aid in their further work. Quality indoor training can play a very important role in increasing the level of physical activity. The reasons why people do not meet a sufficient level of physical activity are often related to weather conditions, which have no influence on this type of training. |

Table 42. Scientific topic 31

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| Title of the scientific topic:<br>Comparison of body mass composition of students of J.J. Strossmayer University of Osijek |
| Theoretical framework, work program and goals of the scientific topic:<br><br>One of the more accessible and popular methods for determining body composition is bioelectrical impedance analysis (BIA). Devices that use the BIA method measure electrical signals (low safe currents of 800 μA) that pass through the components of the body - fat tissue, muscle tissue and water. A weak electrical signal is transmitted to the examinee by means of metal electrodes located on the surface of the personal scale upon contact. The ability to distinguish between tissues is based on the proportion of water in a particular tissue; muscle tissue contains a high concentration of water and acts as an electrical conductor, while fat tissue has a lower concentration of water and therefore acts as a resistor to the flow of electrical current. The characteristics of the subject (height, age, gender) are entered into the device and then, based on the installed software package, the device calculates BMI, the proportion of fat, lean mass and water in the structure of the body composition. The Tanita TBF-300 device is used in this research. The research is conducted on the population of 1st-year students of the Faculty of Kinesiology Osijek and 1st-year students of other faculties of the University of Osijek. The goal of the research topic is to determine whether there are differences in the body composition of students of the Faculty of Kinesiology Osijek and students of other components of the University of Osijek. The assumptions are that students of the Faculty |

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| of Kinesiology Osijek will achieve better results on body composition measurements compared to other students. The reason for this can be found in greater activity from an early age, and also in the fact that by choosing to study at the Faculty of Kinesiology Osijek, students show greater interest in sports and exercise as well as proper nutrition. |
| Expected scientific contribution and possible applications of research results:<br><br>Obesity is considered to be one of the biggest health problems today, and studies show that it develops in childhood. In addition to representing an increasing cost for the health care system, it also represents a great danger to the health of the individual. Scientific contribution of this research and the application of its results are seen in the inclusion of the institution of the Faculty of Kinesiology Osijek in the wider community. With the realized assumptions of this research, we can systematically work on education and promotion of exercise and healthy eating as the only way to preserve health and longevity in a measurable way. |

Table 43. Scientific topic 32

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| Title of the scientific topic:<br>**Correlation of body mass composition with the hand grip test in students of the J.J. Strossmayer University of Osijek** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>The human locomotor system is an organic system that includes bones, muscles, cartilage tissue, tendons, ligaments, joints and other connective tissues. Muscular strength is the component of the locomotor system that is most often researched in the world of fitness. Given that there are no tests that directly assess the muscle strength of the whole body, the dynamometer fist grip test is one of the tests that has been very well researched. It is |

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| a fact that maximum grip strength decreases with age, but people whose strength declines at a faster rate are at greater risk of health problems. The dynamometer hand grip strength test is used to assess upper extremity muscle strength. This test also indicates the condition of the muscle and bone mass of the human body. The Tanita TBF-300 device will be used to assess body composition. This device is based on bioelectrical impedance analysis (BIA) which with the help of electrical signals (low safe current of 800 μA) passes through the components of the body - fat tissue, muscle tissue and water. The characteristics of the subject (height, age, gender) are entered into the device and then, based on the installed software package, the device calculates BMI, the proportion of fat, lean mass and water in the structure of the body composition. The goal of this research topic is to gain insight into the relationship between body mass composition and hand grip strength in the population of students at the University of Osijek. The assumption is that students who achieve lower results in the measurement of body composition will also have lower results in the hand grip strength test, which makes it clear that their lifestyle and diet influence losing muscle strength. In addition, poorer results on the hand grip test may indicate the possibility of numerous difficulties and problems that may arise in later life, such as reduced bone mineral density (BMD) and fracture risk in women (Dixon, 2005, Osei-Hyiaman 1998) or increased mortality from cardiovascular diseases in men (Gale 2006). |
| Expected scientific contribution and possible applications of research results:<br><br>If the assumptions are confirmed, the results of this research will support the thesis that obese people have weaker upper body strength. In addition to eating disorders, these conditions are also accompanied by a lack of activity and exercise, which results in weaker muscle, joint and bone strength. In later life, the consequence of this way of life can be loss of health as well as premature death of a person. We can look for a scientific contribution in the confirmation of the hypotheses of other research that investigates a similar topic. The results of this research can be applied in a way that, in cooperation with the administration of the University of Osijek, we create conditions for the inclusion of as many University of Osijek students as possible in various extracurricular physical activities and workshops on health and proper nutrition. |

### 7.4. Research area 4: Kinesitherapy and Adapted Physical Activity

The goal of the research topics within the research area Kinesitherapy and adapted physical activity is researching and obtaining new scientific knowledge about the role and value of diagnostic procedures in kinesitherapy, as well as planning, programming and evaluation of kinesitherapy procedures for different target groups, i.e. injuries, conditions and diseases, as well as to preserve health. A series of research will be carried out, the goal of which is to study different kinesitherapeutic interventions in the prevention and in the kinesitherapy of numerous injuries, diseases and conditions, as well as in different populations such as people of the third age, children and pregnant women. Furthermore, the connection

between physical activity and exercise with the occurrence of certain conditions and diseases in children and adults will be investigated. The value of innovative approaches in kinesitherapy and rehabilitation, such as the effectiveness of biofeedback assisted rehabilitation, will also be investigated. The research area also includes research into the use of certain tests and tools when assessing and predicting conditions, diseases and injuries, such as measuring hand grip strength and the implementation of certain motor tests in different populations. One of the research topics within this area will deal with the Eurofit Special Test, which is used in people with intellectual disabilities, but has not yet been validated on the Croatian population.
The scientific topics that will be investigated within the research area are listed in the tables below.

Table 44. Scientific topic 33

| Title of the scientific topic:<br>**Physical activity in the third age** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Extending life expectancy brings numerous challenges with the aim of avoiding unhealthy aging and preserving the quality of life. On the one hand, a sedentary lifestyle in old age is associated with increased risks of developing and worsening of chronic diseases and the onset of disability, premature mortality and a significant economic burden for society. On the other hand, increasing the level of physical activity in this population could compensate for the negative effects of aging and reduce the costs associated with inactivity. However, not all modalities of exercise and physical activity work in the same way, and there are significant differences in how certain forms of exercise work on the elderly population. The content of the topic is to investigate how certain exercise modalities can respond to the specific needs of the aging population. The content of the topic refers to increasing the information needed to design optimal, feasible and effective exercise programs for different target groups within the population of the third age. Furthermore, the possibility of using technological innovations when assessing physical activity in the elderly population, as well as technology that can help in implementing and promoting exercise programs in this population, will be explored.<br><br>The goal of the scientific topic is to obtain scientifically based knowledge about the optimal modalities of physical exercise for various health disorders and conditions in old age with the aim of prevention. Furthermore, the goal is to gain new knowledge about the possibilities of using modern technology with the aim of increasing the physical activity of the elderly population. |
| Expected scientific contribution and possible applications of research results:<br><br>Although it is now known that regular physical activity has a positive effect on health and the reduction of morbidity and mortality, there is still not enough scientific knowledge about the optimal modalities of physical activity for the prevention of specific health |

problems in the elderly population. The scientific topic is realized as part of the COST project PhysAgeNet – Network on evidence-based physical activity in old age (CA20104). The expected scientific contribution will be the acquisition of new scientific knowledge about the effect of specific modalities of physical exercise on the specific needs of the elderly population, as well as about the possible use of modern technology to increase physical activity in the elderly population.

Table 45. Scientific topic 34

| Title of the scientific topic:<br>**Effect of kinesitherapy supported by biofeedback in postoperative rehabilitation after implantation of an artificial joint** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Postoperative rehabilitation after installation of a total endoprosthesis of the hip or knee joint is extremely important after surgery because it enables the achievement of independent transfers, movement and functional goals for operated patients. Even after rehabilitation after joint replacement, functional deficits and reduced quality of life remain in a significant number of patients. Currently, there is limited evidence and guidelines for rehabilitation after endoprosthesis of hip and knee, including the type, timing, and dose of rehabilitation interventions, while evidence for the effectiveness of biofeedback-assisted exercises in the rehabilitation of these patients is extremely limited. Although significant efforts have been made to improve patient outcomes after endoprosthetics, including improving rehabilitation protocols, optimal rehabilitation strategies have not yet been established. New technologies such as biofeedback could improve outcomes in this patient population.<br>The goal of the research is to investigate the potential beneficial effects of biofeedback-assisted therapeutic exercises on functional recovery and postoperative pain after hip and knee endoprosthesis. It will be investigated how therapeutic exercise assisted by biofeedback affects functional recovery, quality of life and pain level in patients after joint replacement. The scientific topic is realized on the basis of already conducted research that is registered with The Australian New Zealand Clinical Trials Registry under the code ACTRN12618001782224 in cooperation with experts from the Bizovac Termal Spa. It is planned to continue and expand the research, as well as to conduct secondary analyzes resulting from the already conducted randomized clinical research. |
| Expected scientific contribution and possible applications of research results:<br><br>New equipment, methods and devices come to market every day with the goal of improving patient outcomes, but their comparative effectiveness remains unknown until quality research is conducted. Current knowledge about the optimal modalities of rehabilitation after joint replacement is still limited, and there is a lot of room for optimizing the rehabilitation process. The expected contribution of the scientific topic is to obtain new scientific knowledge about the effectiveness of therapeutic exercise supported by biofeedback technology on objective and subjective functional outcomes, |

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| including pain level, quality of life, lower limb muscle strength, mobility and functional test results. |

Table 46. Scientific topic 35

| Title of the scientific topic:<br>Hand grip strength as a predictor of certain clinical indicators |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Hand grip strength is a simple and reliable measurement procedure for assessing the maximum voluntary strength of hand muscles. It is a useful tool for measuring general muscle strength, diagnosing sarcopenia as well as a clinical indicator of poor mobility, low muscle mass and poor nutritional status. There are indications that reduced hand grip strength is associated with a higher prevalence of certain musculoskeletal and functional disorders.<br><br>The goal of the scientific topic is to conduct a series of research in which the strength of the hand grip will be analyzed in certain circumstances, as well as to connect the strength of the hand grip with certain clinical indicators and psychological aspects. A series of research will be conducted that will cover different populations, from the healthy student population, the population of athletes who play different sports to the population of patients with certain morbidities. The relationship between hand grip strength and the incidence of musculoskeletal disorders, level of physical activity, type of physical activity, and other anthropometric characteristics of the studied population will be examined, and in patients with certain morbidities, the relationship between hand grip strength and their functional state, laboratory indicators and recovery will be examined. As part of the scientific topic, it will be investigated how the application of kinesio taping affects the strength of the hand grip. Kinesio taping will be applied to specific muscle groups and its acute and chronic effects on hand grip strength in a population of healthy individuals will be investigated. |
| Expected scientific contribution and possible applications of research results:<br><br>The expected contribution of the project is obtaining new scientific knowledge about the connection between hand grip strength and certain clinical parameters. The predictability of hand grip strength on the occurrence of musculoskeletal dysfunctions and the association with certain indicators of function and recovery in patients with different morbidities will be verified. The obtained results will bring new scientific knowledge about the possibilities of using hand grip strength as a screening test. Furthermore, new knowledge will be obtained as to whether the application of kinesio taping to specific muscle groups affects the strength of the hand grip. |

Table 47. Scientific topic 36

| Title of the scientific topic:<br>**Frequency of painful symptoms of the musculoskeletal system in the adolescent and student population** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Recent research indicates an extremely high presence of painful symptoms of the musculoskeletal system in the adolescent and student population. Up to 80% of the student population reports the occurrence of pain in the musculoskeletal system within one year, which for a significant number of students prevents the normal performance of daily tasks. Painful symptoms of the musculoskeletal system are negatively related to quality of life, functioning in everyday life and the possibility of playing sports. Lack of physical activity and a sedentary lifestyle are associated not only with painful symptoms of the musculoskeletal system, but also with numerous chronic non-contagious diseases. Data from the literature indicate worrisome trends in the increase of sedentary behavior, but also a decrease in the level of physical activity, not only among adults, but also among the population of adolescents and students. The scientific topic will deal with the occurrence of painful symptoms of the musculoskeletal system in the mentioned populations, and the frequency and regional distribution of painful symptoms of the musculoskeletal system will be investigated. Furthermore, the association of painful symptoms of the musculoskeletal system with the sociodemographic and anthropometric characteristics of the studied population will be investigated, as well as their association with the level and type of physical activity, playing certain sports and a sedentary lifestyle, including time spent in front of screens.<br><br>The goal of the scientific topic is to determine whether there is a connection between certain lifestyle parameters and sociodemographic and anthropometric characteristics with the frequency of painful symptoms of the musculoskeletal system. Furthermore, it will be investigated which body regions are most often affected by painful symptoms of the musculoskeletal system in the studied population. |
| Expected scientific contribution and possible applications of research results:<br><br>The expected contribution of the scientific topic is to obtain new scientific knowledge about the frequency and regional distribution of painful symptoms of the musculoskeletal system in the adolescent and student population. New knowledge will be gained about the relationship between painful symptoms of the musculoskeletal system and the sociodemographic and anthropometric characteristics of the studied population, as well as the relationship with the level and type of physical activities and lifestyle. The knowledge gained will contribute to the creation of preventive strategies that could be used in vulnerable groups of adolescents and students. |

Table 48. Scientific topic 37

| Title of the scientific topic:<br>**Tests for clinical screening in the prevention of injuries of the musculoskeletal system** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Injury prevention is an extremely important task in today's sport and recreation. Injuries in sports and recreation cause an interruption of activities and a decrease in the quality of life, and can have long-term consequences. The use of clinical screening tools is one possibility that can be used for injury prevention. The purpose of clinical screening tests is to identify individuals at higher risk of injury. These tools test movement quality, movement patterns and asymmetries in movement patterns, range of motion, sensorimotor dysfunction, balance, and postural stability. The results of these tests can be used in planning preventive strategies aimed at reducing the risk of injuries. Within the scope of the scientific topic, the validity, reliability and correlation of the results of various tools for clinical screening will be examined, especially the following tests: Functional Motor Screen (FMS), Star Excursion Balance Test (SEBT) and Balance Error Scoring System (BESS). Within the scope of the scientific topic, the usefulness of conducting these tests on different populations of athletes will be determined in order to determine the predictability of the tests for certain sports and injuries, but also their predictability in the general healthy younger population. Previous research has established a certain predictive value of these tests in certain sports, as well as a certain correlation between the results of different tests, however the data are still limited and do not cover most sports.<br>The goal of the scientific topic is to determine the validity, reliability and connection between the results of these tests in different populations of athletes, as well as in the general population of younger people. |
| Expected scientific contribution and possible applications of research results:<br><br>The expected contribution of the scientific topic is to gain new knowledge about the predictability of tests for clinical screening in different populations. Data will be obtained on the validity and reliability of the application of these tests, as well as data on the correlation of the results of different tests. The data obtained will be used to detect individuals at risk of various injuries, as well as to develop preventive strategies that could be used to reduce the risk of musculoskeletal injuries. The long-term effect would be to reduce the frequency of injuries, both in amateur and elite sports. |

Table 49. Scientific topic 38

| Title of the scientific topic:<br>**Physical activity and exercise during pregnancy** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Pregnancy is a special period in a woman's life in which the appropriate level, intensity and type of physical activity is extremely important. Pregnant women who have no contraindications should engage in regular physical activity for a minimum of 20-30 |

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| minutes every day or most days of the week. Various studies indicate the usefulness of physical activity during pregnancy on a whole series of dysfunctions and disorders of the musculoskeletal system, the development of metabolic disorders, as well as a positive effect on preventing excessive accumulation of body mass and psychological well-being. Inactivity during pregnancy is also recognized as a factor that negatively affects the health of the future mother and her child, both in the short and long term.<br>The goals of the scientific topic are research on the influence of physical activity and exercise on the parameters of pregnancy, childbirth, perinatal and postpartum factors in the mother and child. Motivational factors for engaging in physical activity during pregnancy, as well as barriers to exercise, will also be explored. Furthermore, the effect of different forms, intensities and modalities of exercise during pregnancy will be investigated in healthy pregnancies, as well as pregnancies complicated by gestational diabetes mellitus and musculoskeletal problems. The scientific topic is realized on the basis of already conducted research, which is registered with the ClinicalTrials.gov clinical research registry under the code NCT 02196571. It is planned to continue and expand the research, as well as to conduct secondary analyzes resulting from already conducted randomized clinical research. |
| Expected scientific contribution and possible applications of research results:<br><br>The expected contribution of the scientific topic is to obtain new knowledge about the effect of physical activity and exercise on the parameters of pregnancy, childbirth and the postpartum state of health of the mother and child. Motivational factors for physical activity and exercise during pregnancy will also be identified, as well as the most common barriers to exercise during pregnancy. The obtained results can be used to increase the level of physical activity in pregnant women. Furthermore, based on data on the effect of individual modalities, intensity and type of exercise in healthy pregnant women, as well as those who have developed gestational diabetes or musculoskeletal problems, it will be possible to improve the plan and program of kinesitherapy procedures for pregnant women. |

Table 50. Scientific topic 39

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| Title of the scientific topic:<br>**The association of physical activity and inactivity with hypertension in children and adolescents** |
| Theoretical framework, work program and goals of the scientific topic:<br><br>Today, hypertension is responsible for 7.1 million deaths per year and significantly contributes to cardiovascular and kidney diseases such as ischemic heart disease, cerebrovascular insult and chronic kidney failure. Hypertension-related cardiovascular and kidney diseases represent the most common cause of mortality in Europe with an economic impact of approximately 1 billion euros per year. Recent findings support the fact that hypertension is a lifelong problem that can begin already in childhood and adolescence. Preventive programs not only increase life expectancy, but also improve the |

quality of life, reduce the cost of health care and help maintain an active and healthy lifestyle. Lifestyle, including physical activity, sedentary way of living and excess body weight, are risk factors that can be affected by changing behavior. For this reason, it is necessary to investigate the factors underlying this problem, which has reached epidemic proportions. The content of the project is to investigate risk factors and the possibilities of corrective and preventive action on hypertension in children and adolescents using lifestyle changes with an emphasis on increasing the level of physical activity and research on optimal modalities of physical activity.

The goal of the scientific topic is to achieve a holistic understanding of the factors that cause hypertension in children and adolescents, including the connection between physical activity/inactivity and general lifestyle with hypertension in children and adolescents, and the proposal and implementation of corrective and preventive measures.

Expected scientific contribution and possible applications of research results:

Although a significant amount of research deals with the prevention and treatment of hypertension in middle-aged and older populations, relatively little attention is paid to this problem in children and adolescents. The scientific topic is realized as part of the COST project HyperChildNET – Network for blood pressure research in children and adolescents (CA19115). The expected scientific contribution of the research will be obtaining new scientific knowledge about the possibilities of prevention and treatment of hypertension in children by means of lifestyle changes. Furthermore, the contribution of the topic is reflected in the acquisition of new scientific knowledge about the optimal modalities of physical activity for the prevention and treatment of hypertension in children and adolescents.

Table 51. Scientific topic 40

| Title of the scientific topic:<br>**Assessment of the status of motor abilities and traits in the untrained and clinical population** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>The importance of motor skills such as balance and agility has been recognized and researched mostly for the needs of competitive sports. The mentioned motor abilities in the untrained and clinical population have recently been recognized as also important abilities because they indicate the quality of overall motor functioning and mobility, and it is assumed that it is related to the risk of falling down in the elderly population. A satisfactory level of the aforementioned abilities is the basis for the normal daily functioning of the aforementioned groups of society, and recommendations on the importance and influence were given by one of the world's leaders in terms of health-oriented physical activity, the American College of Sports Medicine, which in its guidelines for health-oriented physical activity speaks of the need to develop "neuromuscular" |

capacities aimed at improving agility, balance and coordination at least 2-3 times a week. In fact, the aforementioned abilities are rarely the subject of research outside of sports, and there is modest knowledge about predictor factors and how these predictors determine the level of agility and balance in clinical and untrained populations. However, the first prerequisite of any purposeful kinesiological transformation process is a reliable and valid measurement of the motor status components that are the goal of the transformation process itself. The previous test protocols that were developed for the clinical and untrained population are too general in nature and can hardly provide valid information about the status of balance and agility precisely because of their non-specificity. In addition, there is a very small number of studies that have dealt with this problem of construction and validation of test protocols, which would potentially be applicable to a sample of non-athletes and a clinical population.
Therefore, the goals of this topic are (i) to develop valid and reliable specific tests of balance and agility for clinical and untrained populations, (ii) to establish which predictor factors influence the level and status of balance and agility, (iii) to develop and evaluate rehabilitation and transformational programs which will be focused on the development of balance and agility for the mentioned groups of respondents.

Expected scientific contribution and possible applications of research results:

The expected scientific contributions are primarily related to the goals of the project. First, it is expected that the project will develop testing apparatus, and construct and validate specific measuring instruments for assessing agility and balance for untrained and clinical populations. Second, predictors of agility and balance will be identified for the analyzed groups of subjects. On the basis of the defined predictors, kinesiology transformation and rehabilitation programs will be formed, which will effectively work on the development of agility and balance in the analyzed samples of respondents. Considering the importance of the described motor abilities in sports and in the clinical population, the mentioned research results will have direct implications in practice, especially in terms of the effectiveness of exercise programs in the process of rehabilitation practice in the clinical population, but possibly also in the rehabilitation of athletes. In addition, the contribution of this project to the affirmation and scientific development of the Faculty of Kinesiology Osijek should not be overlooked.

Table 52. Scientific topic 41

| Title of the scientific topic:<br>**Reliability of the Eurofit adapted test - Croatian version** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Previous studies from different countries have indicated a satisfactory level of reliability of the Eurofit Special Test (Skowronski et al., 2009; Houwen et al., 2006). The application of this test and its reliability for Croatia has not been determined by a review of the literature. Eurofit Special Test is a battery of motor tests that is composed of specific exercises for assessing the state of strength, speed, flexibility and balance in people with |

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| intellectual disabilities. The tasks by means of which the measurements were carried out and in which it was determined that they describe the differences are: long jump, 25 m run, bench walk, trunk raises, seated forward bend, and 2 kg medicine ball throw. It has been proven that the Eurofit Special Test was able to differentiate the level of performance according to gender, age and level of intellectual disability.<br><br>The goal of this scientific topic is to determine the reliability of the Croatian version of the Eurofit adapted test using the test-retest method. |
| Expected scientific contribution and possible applications of research results:<br><br>The results of this scientific topic will determine the reliability of the Croatian version of the Eurofit adapted test. In this way, it will help future scientists from Croatia in determining the differences in the motor skills of people with intellectual disabilities. Furthermore, the research resulting from this topic will enable better kinesitherapy work with the population that has intellectual difficulties. |

## 7.5. Research area 5: Interdisciplinary Research in Kinesiology

By definition, interdisciplinary research relies on several scientific disciplines, that is, includes several scientific disciplines when researching new topics or familiar topics, but considered in a new, innovative and different way. The topics of interest to researchers are as diverse as the basic sciences from which they come, and in addition to collaborative synergistic action within our institution, stakeholders from other components of the University as well as external stakeholders are involved in certain topics. Selected areas of interest range from the relationship of physical activities and lifestyle with measurable parameters of health and quality of life, through research into motivation for physical exercise and the transtheoretical model that attempts to describe behavioral changes associated with exercise. Due to the current state of affairs, the topic dealing with the COVID-19 pandemic and issues related to mental health and developed strategies for dealing with athletes with psychological distress caused by the pandemic that is still ongoing, the consequences of which we will only see in the years to come, were inevitable. Related both directly and indirectly are the topics of the consequences of distance learning on the mental health of students in this context, and the indirectly related topic of physical self-concept in early adulthood, age period to which most of our students belong. Also, specific topics that are investigated interdisciplinary, for example one of the oldest sports - sport fishing, where an attempt will be made to answer the question about the experiences of sports fishermen or a specific topic about the influence of nutrition, specifically chicken enriched with carnosine, on the state of microcirculation and measurable physiological parameters of athletes. Developing technology certainly has an impact on sports and athletes, which we witness every day, so the topic of the possibility of applying various existing and upcoming immersive technological solutions for the interface of humans (athletes) to different computer systems was proposed. No less interesting and no less important, but often overlooked, is the topic of inevitable ethical challenges brought about by a transhumanist approach to sports, around sports and far beyond. One of the scientific topics also deals with future educators, and will investigate and try to provide answers to the questions of self-assessment of the Physical Education teachers' competence, especially for work in sensitive inclusive educational institutions. Furthermore, the culture of the higher education institution/teaching, as well as the intercultural competence of teachers in upbringing and education, will be investigated. At the end of the introduction, it is necessary to mention an extremely current scientific topic, which is the academic integrity of students and teachers in higher education. From the above mentioned, it can be concluded that this research area deals with a wide range of topics and researchers with broad interests and an interdisciplinary attitude and approach to selected research topics.

The scientific topics that will be investigated within the research area are listed in the tables below.

Table 53. Scientific topic 42

| Title of the scientific topic:<br>**Relationship between physical activity and lifestyle with certain parameters of health and quality of life** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Lack of physical activity and a sedentary lifestyle are associated with numerous chronic non-contagious diseases that are becoming epidemic in today's world. Data from the World Health Organization indicate an extremely high prevalence of physical inactivity and sedentary behavior, both among the adult population and among young people. Knowledge about the impact of sedentary behavior on health parameters, although they indicate a negative effect of such behavior, is still limited. In addition to the direct impact on physical health, physical activities and exercise can positively affect people's well-being, improve mood and reduce symptoms of depression and anxiety. Affects and moods in the context of physical exercise play an important role in health promotion. Physical activity is a positive health behavior that is to be encouraged. Therefore, it is important to examine how people feel during and after such activities, which can be crucial in making decisions about whether to continue exercising. Emotions also have motivational features for health-related behaviors and are also important outcomes in their own right. However, the relationship between the intensity of physical activity and positive affects, as well as the type of physical activity and different affects, is still not clear. Physical activity can be effective in improving people's well-being. Furthermore, the question of the contribution of physical activity in alleviating psychological difficulties, as well as its role in improving the quality of life and prevention, is current. Psychometric validation of instruments that have not yet been used in the Croatian language will also be carried out.<br>The goal of the scientific topic is to investigate the connection between physical activity, sedentary lifestyle and lifestyle habits with certain parameters of health, quality of life and well-being in the adult and adolescent population. |
| Expected scientific contribution and possible applications of research results:<br><br>The expected contribution of the scientific topic is to obtain new scientific knowledge about the level and type of physical activity in the adolescent and adult population, as well as about the relationship between physical activity, a sedentary lifestyle and certain lifestyle habits with the quality of life, including the quality of sleep. This project will comprehensively examine quality of life in relation to health, which is defined as the perception of people's functioning in several areas: global measures of quality of life, physical functioning and symptoms, and psychological, emotional and social well-being. In this way, it would contribute to the development of preventive strategies and the detection of vulnerable groups. |

Table 54. Scientific topic 43

| Title of the scientific topic:<br>**Experiences of sports fishermen** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Sports fishing is one of the oldest sports, which appeared in Europe at the end of the 18th century, and can be defined as fishing for recreation and competition. The International Sports Fishing Confederation (CIPS) today has over 50 million members and holds competitions in over 20 disciplines. One of the most popular disciplines practiced by the largest number of fishermen is float fishing. Catching fish is only one of the many components of the fishing experience. Getting away from routine, experiencing nature, and being with family/friends are also important motivations for going fishing and other outdoor recreational activities (Driver & Cooksey, 1977; Fedler & Ditton, 1994). The concepts of motivation and satisfaction are often used in social and psychological research of human dimensions in competitive and recreational fishing, where it is necessary to understand the expectations of fishermen that serve as predictors of certain behaviors (Arlinghaus, 2006; Fedler & Ditton, 1994; Holland & Ditton, 1992).<br>The goal of this scientific topic is to examine the basic sociodemographic data, preferences and some experiences of fishermen regarding the demands of the sport, technique, teaching, frequency and use of fishing equipment. Questionnaires and scales related to some forms of behavior during sport fishing, commitment to that sport discipline, assessment of theoretical knowledge, satisfaction and certain attitudes when going fishing as well as with life itself will also be applied. |
| Expected scientific contribution and possible applications of research results:<br><br>The research will be conducted on a sample of Croatian sports fishermen of different training and chronological age. Within the presented problem, the influence of skill and technique, knowledge, experience, stress, satisfaction, attitude towards the fish caught and the environment in the process of competitive sport fishing will be analyzed. Also, the research will evaluate different indicators of the importance of certain segments of fishing (interaction with fish, achievement, escape from stressors, stay in a natural environment) in relation to parameters related to the catching of fish itself during various competitive and recreational fishing activities. |

Table 55. Scientific topic 44

| Title of the scientific topic:<br>**Motivation for physical exercise** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Motivation, confidence, knowledge and understanding of content in physical education are just as important as the individual's physical ability (Hardman, 2011). That is why an important factor in physical activity research is understanding the motivation that contributes to involvement and participation in physical activities. Knowing why an activity is needed, what role it plays in achieving a goal, and how successful we are in it, |

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| gives the activity meaning and makes us more motivated to do it. Motivation is certainly one of the most important components in the personality structure, which represents the dynamic strength of the personality and is therefore considered important for explaining behavior (Šimunić and Barić, 2011). It is the motivational processes that are the most significant factor that will move an individual from a sedentary lifestyle to regular exercise and represent the initial incentive to replace the virtual space with physical activities. While many individuals from a sedentary lifestyle easily get over the initial hurdle of getting started with physical activity, research has shown that actually the biggest challenge is staying persistent in exercising. The factors that motivate people to start exercising are not necessarily the same factors that will motivate them to stay active over time. Motivation for physical exercise can be caused by intrinsic and extrinsic motives. In numerous studies, intrinsic motivation has been recognized as a critical factor in greater investment of effort in activity, greater satisfaction with exercise, and even better exercise effects, both in sports and in physical education (Burstadi et al., 2001; Ntoumanis, 2001; Theeboom , De Knop and Weiss, 1995). Intrinsic motivation for exercise is a freely chosen degree to which an individual is ready to engage in physical activity and make an effort to exercise because of the pleasure he feels while doing so, and not because of any external reasons. Extrinsic motives (such as rewards, grades, social recognition, improved appearance) can lead to tension and pressure during exercise, which can result in poorer performance, while intrinsic motives (such as enjoyment, challenge, skill mastery, sense of belonging) relieve individuals of pressure and enable enjoyment in exercise (Markland et al., 1992).<br>The goal of the scientific topic is to conduct a series of tests where the motivation for physical exercise will be analyzed and measured in different populations that engage in physical exercise. |
| Expected scientific contribution and possible applications of research results:<br><br>Previous research points to the need for research into motivation and behavior in the field of physical activity and the development of better programs and interventions to improve kinesiology patterns of behavior. In the area of motivation for a sports activity, that is, the desire to participate in the exercise process, there are several different motivations that encourage an individual to a higher or lower level of physical activity, which is evident from previously conducted research.<br>The knowledge obtained from the field of motivation research can be very useful to use in more intensive participation in different physical activities. Based on the results, researchers should know how much kinesiology content interests the trainees, whether they feel free during exercise, how much they enjoy certain physical activities, etc. |

Table 56. Scientific topic 45

| Title of the scientific topic:<br>A transtheoretical model of exercise-related behavior change |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Behavior change is often explored within the framework of the Transtheoretical Model, which is described as an integrative and basic model of behavior change and can be found in all major theories of psychotherapy. It was originally designed to investigate negative addictions such as smoking, and initial research results found that successful changes occurred on their own without professional intervention.<br><br>The transtheoretical model describes the different stages that individuals go through in shaping and maintaining behavior. The stages are labeled as precontemplation, contemplation, preparation, action and maintenance. In the precontemplation stage, the individual has no intention of changing his behavior in the near future (usually defined as the period of the next six months). In the contemplation stage, such an intention already exists, the person thinks about options, but reconsiders and is still not sure.<br>In the preparatory stage, a person makes a decision to change his behavior in the very near future. In the stage of action, the individual is actively involved in changing his behavior (eg. he starts exercising, watching his diet), and if he maintains the change long enough (usually a period of six months) he can be classified in the maintenance stage. Progressing through the stages is conceptualized as a cyclical rather than a linear process, so most people cycle through these stages several times before achieving sustainable change. In addition to research related to risky behavior, the stage change model has been applied many times in the field of increasing the level of physical activity and motivating individuals to start exercising regularly. |
| Expected scientific contribution and possible applications of research results:<br><br>When promoting exercise, it is believed that the success in adopting a regular exercise program depends to a large extent on the reasons for exercising. People who exercise for internal reasons, such as enjoyment and feeling good, tend to persist in exercising more than those who exercise for some external reason, such as external pressures or achieving a reward. With regard to the above issue, it would be interesting to investigate some relationships between motivation to exercise and the transtheoretical model of behavior change related to exercise. Trainees at the turning point to permanently accept exercise as a lifestyle need positive feedback, reevaluation of goals and coping strategies with life stressors that could cause them to give up. |

Table 57. Scientific topic 46

| Title of the scientific topic:<br>**Contributions of certain traits and coping strategies of athletes to psychological distress during the Covid-19 pandemic** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>In order to reduce the spread of viral infection and preserve the health of the entire population, restrictive protection measures were introduced at the beginning of the pandemic, which indirectly prevented the smooth performance of sports activities. The sudden and unexpected termination of the season made the transition period difficult and presented a strong barrier in the development of a sports career (Stumbulov et al., 2020). The results of reducing the frequency and duration of athletes' training during the Covid-19 pandemic have led to the impairment of athletes' mental health (Mon-López et al., 2020; Şenışık et al., 2021; Facer-Childs et al., 2021). Athletes were faced with an additional difficulty with the pandemic due to the reorganization of the work of coaches, associates and sports organizations that are involved in managing their activities. To deal with all the aforementioned stressors, well-developed coping mechanisms are needed (Schinke et al., 2017). Therefore, the main goal of this research will be to examine the contribution of some personality traits and coping strategies to the general distress experienced by athletes during the Covid-19 pandemic. The research will be conducted using the online version of the questionnaire on a sample of athletes from the Republic of Croatia and Bosnia and Herzegovina. As part of the socio-demographic data, information will be collected about the age, gender, category and type of sport the athletes play, their fitness and health status, and training level before and during the Covid-19 pandemic. From psychological constructs, stress coping strategies, levels of depression, stress and anxiety, and perfectionism will be examined. |
| Expected scientific contribution and possible applications of research results:<br><br>This research is expected to provide new scientific knowledge about the contribution of some personality traits and coping strategies to the psychological distress experienced by athletes during the Covid-19 pandemic. The level of psychological distress will also be determined depending on the expression of the athlete's maladaptive perfectionism, that is, the athlete's mental state. The findings of this research will enable the development of an intervention program related to the negative effects of non-adaptive coping strategies and the positive effects of using adaptive strategies, especially in the form of professional adaptation to the pandemic and post-pandemic period. The obtained results will provide practical application and guidelines in the work of coaches and athletes in the service of preserving and improving mental health. |

Table 58. Scientific topic 47

Title of the scientific topic:

**The effect of carnosine-enriched chicken on the improvement of microcirculation and physiological parameters in athletes**

Theoretical framework, work program and goals of the scientific topic:

Carnosine is a water-soluble endogenously synthesized dipeptide found in the brain, heart muscle, kidney, stomach, and in large quantities in skeletal muscle. S. E. Severin devoted most of his working life to the study of carnosine and related dipeptides, and was the first to describe the functional response of muscles to carnosine, showing that in the presence of carnosine, muscles can accumulate enormous amounts of lactate, and in its absence, lactates cause dramatic tissue asicification, causing its contraction (Kralik and Bosnar, 2012., according to Severin et al., 1953). Carnosine is widely used among athletes in the form of dietary supplements, and has a beneficial effect on various diseases. Its component, the amino acid beta-alanine, is particularly interesting as a dietary supplement for athletes because it increases muscle carnosine, and improves the effectiveness of exercise and stimulation and contraction in muscles (Jukić et al., 2021). However, there is insufficient knowledge about the potential use of carnosine in enriched foods.

In cooperation with the Faculty of Medicine in Osijek, research will be conducted with the goal of examining the impact of a carnosine-enriched diet on microcirculation and the level of endurance in a group of athletes. The sample of respondents will consist of two groups of trained athletes from endurance sports, namely: a) 20 trained long-distance athletes (experimental group), and b) 20 trained triathletes (control group) aged 18 to 30 years. The sample of variables will be the results of measuring functional parameters (laser doppler, post-occlusive reactive hyperemia, biochemical parameters, and spiroergometry under load). Athletes will be monitored in their systematic implementation of training, and records will be kept on the consumption of chicken with the addition of caronosin. Likewise, each athlete will keep a personal food diary to gain insight into their eating habits. Two measurements will be performed, the first (basal) measurement before the start of the protocol and after three weeks during which the subjects (athletes) will consume plain (control group) and functionally enriched chicken with carnosine (experimental group). Static data processing methods will examine the difference between the experimental and control groups, and within them immediately before and after the three-week diet protocol.

Expected scientific contribution and possible applications of research results:

The expected scientific contribution of this research is primarily manifested in the fact that information will be obtained whether the consumption of functionally enriched food can affect the improvement of microcirculation and general characteristics of high training load in athletes. Furthermore, the possible improvement of immune parameters (anti-inflammatory parameters), increase of antioxidant capacity and reduction of oxidative stress will be determined in subjects who will consume chicken enriched with carnosine. Scientifically supported results and recommendations will be provided on the

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| impact and consumption of carnosine-enriched nutrition on improving the athlete's performance. In the same way, an insight into the eating habits of athletes will be gained, which will enable the definition of guidelines for increasing their quality as a whole. With this original scientific research, successful cooperation with the Faculty of Medicine in Osijek will be achieved and will open the possibility for further experimental research. Dissemination of the obtained research results would include a minimum of three scientific articles in the WoS and Scopus databases along with active participation in conferences. |

Table 59. Scientific topic 48

| Title of the scientific topic:<br>Body self-concept in early adulthood |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>The concept of self is a psychological construct that relates to experiencing, evaluating and thinking about oneself. It is based on experiences and interactions with the social environment and the attributions we create when evaluating our own behavior. The concept of self includes an assessment of abilities, skills, feelings and attitudes in various areas that are important to the individual - social, academic, emotional. Previous research confirms the connection between the concept of self, psychological adjustment and well-being. The main developmental task of adolescence is the formation of identity, and education plays an important role in forming a positive and healthy concept of self in young people. Physical self-concept proves to be important for the development of an active and healthy lifestyle. Young people who have a more positive physical self-concept are more often involved in physical activities and sports.<br><br>One of the goals of this scientific topic will be to test the reciprocal effects model according to which physical self-concept and exercise (behavior) are positively and reciprocally related. According to this model, prior positive physical self-concept will lead to greater compensation for exercise behavior. Also, a higher level of prior exercise will lead to a subsequent more positive physical self-concept.<br><br>Another goal is to investigate gender differences in body self-concept, since important physical and psychological changes occur in young people, which become more pronounced with regard to gender.<br><br>The third aspect of this scientific topic is the verification of differences in various aspects of physical self-concept of kinesiology students and other students.<br><br>The fourth goal of the scientific topic is the development and adaptation of a measuring instrument for testing the physical self-concept of students in the Croatian language and checking the measurement characteristics. |
| Expected scientific contribution and possible applications of research results: |

The scientific contribution of this scientific topic is manifested in the discovery of new knowledge in the field of physical self-concept with regard to gender and the effects of education that includes theoretical and practical content on physical exercise and sports. Also, the model of mutual effects between body self-concept and exercise will be tested. The obtained results will be compared with existing findings on body self-concept in Western and Eastern countries, considering the socio-cultural framework. Through this research topic, an appropriate measuring instrument will be developed to examine the various components of students' physical self-concept, and the measuring characteristics of the questionnaire will be checked.

Table 60. Scientific topic 49

| Title of the scientific topic:<br>Distance learning and mental health of students in the context of the pandemic |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>In response to the emergence of the COVID-19 pandemic, there have been significant changes in higher education. Most often, classical teaching was replaced by distance teaching and was carried out in different forms (through live video conferences, sending lectures in audio and visual form to students, sending presentations, communicating via forums, etc.). One of the important aspects of teaching is communication between teacher and student, which enables transactional interaction. Through communication, the teacher determines the individual needs of students, emotions and potential difficulties in the teaching and learning process. Therefore, one of the goals of this scientific topic is to examine the way classes are held during the pandemic and the level of student satisfaction with different forms of teaching. Such a significant change in the way of education can have negative consequences on the mental health of students. The findings so far confirm the existence of negative effects of the pandemic on the mental health of students, as well as the occurrence of high levels of depression and anxiety. Consequently, such negative effects may also have negative effects on the cognitive functioning and educational performance level of students. Therefore, the second goal is to determine the proportion of students with a high risk of psychological distress compared to the proportion of students with a low risk. Gender differences with regard to the occurrence of psychological distress will also be examined. The level of academic performance and concerns of students at low and high risk of psychological distress will also be investigated. |
| Expected scientific contribution and possible applications of research results:<br><br>The scientific contribution of the scientific topic on distance learning and mental health of students in the context of the pandemic is reflected in new knowledge about the relationship between the maintenance of different forms of teaching and the mental health of students. Also, data will be collected on the relationship between psychological distress and academic performance and students' concerns about different aspects of |

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| life. This research will give an insight into the differences in psychological distress between male and female students during the pandemic. The obtained findings will be used for scientific purposes and the dissemination of the obtained results, but also as feedback from students about the quality, satisfaction and ways of holding classes during the pandemic. |

Table 61. Scientific topic 50

| Title of the scientific topic:<br>Ethical challenges of transhumanism in sport |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Transhumanism is most often defined as an intellectual, cultural, scientific and artistic movement which, based on the combination of science, technology and economy, supports and encourages the development and use of new scientific and technological solutions to improve human physical, mental and other abilities and to improve natural skills. It is also used for the cancellation of all those undesirable and unnecessary aspects of the human condition, such as suffering, disease, old age and death. Many members of transhumanism consider it a kind of extension of humanism or ultrahumanism that has 'outgrown' secular humanism and the Enlightenment. Like humanists, transhumanists believe in reason, progress and values that in their foundations imply the well-being of man, but not in some kind of "external" (religious) authority. In recent times, the issue of "improving" athletes on a genetic level has become more and more relevant, and there is a talk of homo athleticus, which would be genetically designed to achieve top sports results. One of the key questions to be answered is the question of the ethical justification of technical interventions in the human genome, and related to this is the question of responsibility.<br>As part of the scientific topic, through a systematic analysis of scientific material on transhumanism, we will investigate the possibilities of applying transhumanist ideas in the field of sports, and their ethical (un)justification.<br>After finishing the analysis and research, we will publish our findings in the form of a scientific paper in one of the humanistic scientific journals, and offer several topics from this area as topics for final and graduate theses at the Faculty of Kinesiology Osijek. |
| Expected scientific contribution and possible applications of research results:<br><br>The expected scientific contribution is manifested primarily in the clarification of the concept of transhumanism and its connection with modern sports. In this sense, we believe that this is a very interesting and important topic in the training of future kinesiologists, because it will provide them with an insight into the latest scientific knowledge with a simultaneous emphasis on all possible ethical doubts that the development of technique and technology causes in this area. |

Table 62. Scientific topic 51

Title of the scientific topic:

**Self-assessment of the competence of Physical Education teachers for work in an inclusive educational institution**

Theoretical framework, work program and goals of the scientific topic:

Inclusion refers to the equality of all participants in the inclusive process and enables a better attitude towards diversity. Inclusion strives to develop a sense of tolerance of the social community and strives to provide support for people with developmental disabilities so that they can participate equally in the life of the community, and it is observed in its application, and not just in representation of inclusion as an idea. The concept of inclusion refers to the creation of conditions for all children by ensuring a suitable environment for their development and the fulfillment of basic needs, without emphasizing developmental difficulties, talents, socioeconomic status, origin, etc., and connects children with developmental difficulties and children without them (Mikas and Roudi, 2012). The National Framework Curriculum requires the provision of learning conditions for all students in accordance with their capabilities and needs with the principles: high quality education for all; equality of educational opportunities for all; inclusion of all students in the educational system and respect for human and children's rights. The quality of a teacher's professional activity is determined by the competencies of initial education, it is also determined by professional beliefs that encourage or prevent the further development of the teacher's competencies (Domović, 2011), and include knowledge and use of educational work methods while taking into account abilities, needs and uniqueness of each student (Zrilić, 2011). The open curriculum and binding laws and legal acts related to ensuring appropriate conditions are considered prerequisites for inclusive upbringing and education, as well as schooling models, individualized programs, and especially the competencies of participants in inclusive upbringing and education (Zrilić, 2018). Educational institutions are the starting point of inclusion and the quality of inclusion depends on the participants of the inclusive process, with the emphasis being placed on teachers. The participation of teachers in achieving inclusion is crucial, and it depends on professional training, knowledge, and social competences.

The subject of the research is the attitudes of Physical Education teachers in Osijek, because beliefs are the main prerequisite for achieving inclusion. Therefore, the goal of the research is to: examine teachers' attitudes towards inclusion, determine whether there is a difference in teachers' attitudes in relation to work experience, examine whether teachers consider themselves competent to work with children with developmental disabilities.

For the purposes of the research, a survey questionnaire on teachers' attitudes towards inclusion will be constructed. The first part of the questionnaire will contain several questions related to the sociodemographic characteristics of the respondents (gender, age, years of work experience), as well as questions about attending courses on working with children with developmental disabilities at the university, additional professional training, knowledge of legal provisions, experience working with children with

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| developmental disabilities and insufficient competence (knowledge, abilities, skills, beliefs) for working with children with disabilities. |
| Expected scientific contribution and possible applications of research results:<br><br>The conducted research will show if teachers' attitudes towards inclusion differ with regard to work experience with children with developmental disabilities, years of work experience and place of work (primary school, secondary school, higher education institution). The paper will present the results of the self-assessment of the competence of Physical Education teachers for work in inclusion in the area of the town of Osijek in three subsystems of upbringing and education. The teacher's vocation has several components, and for the quality implementation of inclusion, a positive attitude towards students with disabilities is important as initial education, because newer study programs of higher education institutions contain courses that train them to work in an inclusive educational institution. Research on the development of inclusion in Croatian educational practice is not sufficient, and the mentoring model should be verified by research or a case study that would be as close as possible to the assumed theoretical concept in terms of the roles of stakeholders. The scientific contribution is based on the results of the research and is a potential value for students with developmental difficulties as well as educational workers and generally more optimal development of inclusion. The obtained results can be an incentive for enriching the curriculum, as well as for new research in this area, and it is visible in the representation and scientific argumentation of the need for the affirmation of an inclusive culture. |

Table 63. Scientific topic 52

| Title of the scientific topic:<br>**Possibilities of application of non-invasive man-machine interfaces in sports** |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>The human-machine interface is any form of interaction between a human and a device, machine or content that is not natural. Every device, machine designed and brought to life by men has some form of interface to man. From tactile, to more recent different forms of audio-video interfaces, to today's progressive technologies such as: artificial realities, VR (virtual reality), AR (augmented reality) to indirect and direct human-brain-machine interfaces that open up a multitude of possibilities but also a considerable amount of questions. The majority of questions can be divided into several major areas: technical-technological, legal and ethical issues. All today's advanced technologies are basically collections of many different technologies so that we have different immersive and interactive technologies and interfaces with different levels of immersion and interactivity. Speculations about the future and the next level of the human-machine interface of these technologies are different, and currently there is a certain consensus that the development of: new materials, artificial intelligence, the Internet, cognitive computing and cloud computing will play a certain role of unclear importance. |

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| As part of the scientific topic, through the analysis of professional and scientific literature, primarily about non-invasive interfaces, we will investigate the possibilities of their application in sports.<br><br>After the completion of the analysis and research, we will publish our findings in the form of a scientific paper in one of the interdisciplinary scientific journals, and offer several topics from this area as topics for final and graduate theses at the Faculty of Kinesiology Osijek. |
| Expected scientific contribution and possible applications of research results:<br><br>The expected scientific contribution is manifested for the most part in the systematic analysis of the current state of technology, i.e. maturity and applicability in sports. The predictability of the possible direction of development and emergence of new technologies is limited and there is a certain degree of uncertainty. For this reason, we believe that this is an important and attractive topic and necessary for kinesiologists, as well as for everyone who thinks about the future, because it gives insight into new technologies and gives them a starting point for further research and active help to make concrete implementations. |

Table 64. Scientific topic 53

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| Title of the scientific topic:<br>Researching the culture of a higher education institution/teaching |
| Theoretical framework, work program and goals of the scientific topic:<br><br>Pedagogically legible concretizations of the culture of a higher education institution can be viewed from the perspective of pedagogical culture, didactic culture, relational culture, specific culture of an educational institution, organizational culture, and organizational and pedagogical leadership. The research will be focused on three of the above-mentioned concretizations of the culture of the educational institution.<br>The first of them is the didactic culture, by which we mean the values, beliefs and attitudes of the leaders of the teaching process about the subjects and individual segments of the teaching. Values, beliefs and attitudes significantly influence the teacher's behavior and relationships in the classroom and therefore it is justified to study them more closely. The contemporary positioning of teachers as reflective practitioners in the educational process implies taking and understanding the student's perspective. The implicit pedagogy of practicing teachers is contained in the communicative educational context and is evident in the position that an adult chooses in relation to a student in the educational process. Theory in action is an important part of the reflection and self-reflection of practicing teachers and a way of choosing clear and differentiated roles in a dynamic teaching practice area. Leadership is a multi-layered and multi-dimensional theoretical phenomenon that, from the perspective of managing people and processes in an educational institution, focuses on developing relationships, strengthening partnerships, and developing teams and networks of the learning |

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| community. At the same time, the scientific research interest focuses on the impact of distributed and transformational and contextual leadership on the higher education institution and on all processes in it.<br>The goals of the research are: to conduct research in higher education institutions that will analyze the culture of relationships between students and among teachers who are reflective practitioners, and to conduct action research in a higher education institution with the goal of analyzing and changing the positions of practitioners in the educational process. |
| Expected scientific contribution and possible applications of research results:<br><br>The focus of the research is on curriculum development and positive culture. The results of the research will help teaching faculties in creating mandatory or elective courses on organizational culture, highlighting individualization, cooperation and supportive communication as elements of curriculum culture. The paper provides a scientific contribution to the modernity of the topic of the hidden curriculum in the culture of a higher education institution and a theoretical explanation of the need for co-constructing a new curriculum. They are a contribution and incentive for changes in the democratization of the educational process in educational practice. The scientific contribution of the work is in the effective professional development of teachers. The research will improve the area of professional development of teachers through the redesign of pedagogical documentation and continuous professional discussions of teachers at reflective practicums. |

Table 65. Scientific topic 54

| Title of the scientific topic:<br>Intercultural competencies of teachers in upbringing and education |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Learning and understanding others different from us as well as understanding ourselves is an intercultural competence (Piršl, 2017). The topic is the continuation of previous multi-year scientific research such as leading a European project and current relevant research, such as the Intercultural Curriculum, intercultural competencies and sensitivity of teachers, and interculturalism and European values.<br><br>Scientific, pedagogical foundation of the intercultural approach towards sensitive groups of students (students belonging to national minorities, students whose mother tongue is not Croatian (Roma students, migrant students), students belonging to religious minorities, students belonging to sexual and gender minorities, students with disabilities, students with difficulties) in the Republic of Croatia is present in educational models, school curricula, textbooks, etc. The analysis of past experiences and achievements in the Republic of Croatia and the European Union is in the field of the culture of democracy, multiculturalism and respect for the rights of sensitive groups of students, European values, competences for communication with people of different cultural origins, and the |

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| implementation of research on intercultural competences and intercultural sensitivity, as well as the conception of a coherent and complete framework of the integration of the mentioned sensitive groups of students. The National Framework Curriculum with its values (knowledge, responsibility, identity, solidarity, tolerance, humanity) implies new approaches in pedagogical theory, (co)construction of school development curriculum, implementation in educational practice and the need for research in this area.<br><br>Goals of the research are:<br>1. To define some of the important determinants of the co-construction of the intercultural curriculum (social distance, intercultural predispositions, European values, intercultural competencies and intercultural sensitivities of kinesiology students).<br>2. Analyze existing models and highlight examples of good practice in the education of students with disabilities and students with difficulties based on modern (inclusive) pedagogy and specific methodological approaches.<br>3. Conduct empirical research on intercultural competences and European values of students of several faculties at Josip Juraj Strossmayer University of Osijek.<br>Activities include the acquisition of relevant foreign and domestic literature; publication of two scientific papers, co-organization of the conference Education for Interculturalism, chairmanship of the program committee of the conference, editorship of proceedings from the conference in co-publishing with the Academy of Sciences and Arts, and mentoring a doctoral thesis on the topic of interculturalism. |
| Expected scientific contribution and possible applications of research results:<br><br>The results of the research will help teacher faculties in creating an elective course on the importance of intercultural competence of teachers in the culture of an educational institution. Students, future teachers will learn the importance of respecting different cultures in upbringing and education in the future workplace and in professional work. Theoretical analysis and research results will contribute to pedagogical theory. The research will advance the field of teacher professional development, and empirical evidence will contribute to the design and implementation of teacher professional development. |

Table 66. Scientific topic 55

| Title of the scientific topic:<br>Academic integrity of students and teachers in higher education |
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| Theoretical framework, work program and goals of the scientific topic:<br><br>Academic integrity includes the values of the academic community and acting in accordance with them, provides an incentive to promote universal values and strengthen honesty and integrity in society. Which values the university teacher will "transmit" and which values the students will adopt depends on the implicit values of the university professors. The values of academic integrity are universal, they will always be highly valued and should encourage ethics in education, science and society in general. |

Research on the frequency of ethical dishonesty at Croatian universities is rare, while the available research indicates the persistence of dishonest behavior among students. The research results of Štambuk, Maričić and Hanzec (2015) show that academically dishonest actions are an integral aspect of students' educational experiences and that such actions are a structural problem of the Croatian education system. Research also shows that the number of those who cheat has been increasing for the last few decades (Curran, Middleton and Doherty, 2011), which the authors associate with a greater need for success in today's highly competitive global world. At the same time, the way of cheating has changed and it is possible to talk didactically about traditional and modern methods (Curran, Middleton and Doherty, 2011). Other reasons why students cheat are misunderstanding and lack of interest in the material, being overloaded with teaching, while others also do it without punishment by belittling the meaning (it doesn't matter to them or to the professors) (Jones, 2011). Academic failure is the result of the procrastinating behavior of students, assistants and professors, and the habit of postponing exams, procrastinating on taking final exams, exceeding the deadlines for creating seminar papers, asking for an extension of deadlines in order to complete assignments, are examples of the behavior of students and professors. Procrastination and academic dishonesty are positively correlated, showing an increase in the first years of study, and a sharp decrease immediately before graduation (Mercè et al., 2012). Authoritarian pedagogical style of professors as well as disinterest of professors and assistants influence academically undesirable student behaviors while a large number of students do not try to change this behavior (Patrzek, Grunschel, and Fries, 2012).
The goal of the research is to examine the academic integrity (knowledge, attitudes, behaviors and values) of students and teachers, as well as the correlates and predictors of academic integrity in students, and to improve the quality of higher education teaching. Academic integrity will be tested with a newly constructed questionnaire, as well as correlates and predictors of academic integrity. Correlates and predictors will be divided into several categories: personal factors (personality factors, motivational factors, emotional factors, life values, procrastination and socio-demographic factors), situational and contextual factors, and social and systemic factors. The academic integrity of the professors of several higher education institutions that educate future teachers in different fields of science will also be examined.

Expected scientific contribution and possible applications of research results:

Personal, situational, contextual and social factors correlate with academic integrity, and the scientific contribution of this research is greater considering the lack of research on predictors of academic integrity among students and future teachers. Gradual changes in the culture of university teaching, and thus in the culture of higher education institutions to achieve a positive hidden curriculum, will lead to positive beliefs and better results of students through systematic monitoring, evaluation and self-evaluation of the results of their work. The results of the examination of the academic integrity of professors will be used for the purposes of improving the quality of higher education teaching and raising the dignity of the teaching profession.

## 8. STRATEGIC GOALS OF SCIENTIFIC RESEARCH ACTIVITIES FOR THE PERIOD 2022-2026

*Based on the analysis of the current state and potential, it was identified that the Faculty of Kinesiology Osijek in the next strategic period strives to improve the quality, recognition and international visibility of scientific research activities with the aim of generating new knowledge in the field of kinesiology and related disciplines and achieving the status of a prominent component of Josip Juraj Strossmayer University of Osijek in the Central European region. The aforementioned will be achieved through the achievement of the following strategic goals:*

1. Create a stimulating, multidisciplinary and interdisciplinary scientific environment with the goal of achieving scientific recognition and excellence,
2. Improve and maximize the human and material resources of the Faculty for the purpose of national and international recognition and excellence,
3. Connect with the local community with the aim of implementing joint research activities that will result in the development of society and the popularization of science,
4. Provide material and organizational infrastructure for the scientific research activity of the Faculty,
5. Connect with similar institutions in the European Research Area with the goal of implementing joint research activities that will result in international recognition and top scientific achievements

| STRATEGIC GOAL 1: Create a stimulating, multidisciplinary and interdisciplinary scientific environment with the aim of achieving scientific recognition and excellence | |
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| Measure 1.1. | Monitor the quality and provide conditions for scientific research activities of the Faculty |
| Measure 1.2. | Encourage the publication of scientific papers in journals indexed in WoSCC and Scopus databases, especially in journals that belong to the Q1 and Q2 categories |
| Measure 1.3. | Encourage the application of scientific projects, especially competitive projects, and provide institutional support for the application and implementation of projects |
| Measure 1.4. | Increase the number of scientists and strengthen young scientific staff |

| STRATEGIC GOAL 2: Improve and maximize the human and material resources of the Faculty for the purpose of national and international recognition and excellence | |
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| Measure 2.1. | Ensure the dissemination of the results of scientific research |

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| Measure 2.2. | Encourage involvement in international research groups |
| Measure 2.3. | Start Faculty's journal and scientific conference |

| STRATEGIC GOAL 3: Connect with the local community with the aim of implementing joint research activities that will result in the development of society and the popularization of science | |
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| Measure 3.1. | Connect with the local community on joint scientific research projects |
| Measure 3.2. | Connect with the local community through knowledge and competence dissemination activities |
| Measure 3.3. | Participate in science popularization activities |

| STRATEGIC GOAL 4: Provide material and organizational infrastructure for the scientific research activity of the Faculty | |
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| Measure 4.1. | Establish and equip scientific laboratories |
| Measure 4.2. | Improve the IT and library resources of the Faculty |

| STRATEGIC GOAL 5: Connect with similar institutions in the European Research Area with the goal of implementing joint research activities that will result in international recognition and top scientific achievements | |
|---|---|
| Measure 5.1. | Develop a stimulating environment for international mobility of students, teaching and non-teaching staff |
| Measure 5.2. | Get involved in international activities by connecting with institutions from the region and the European Research Area |
| Measure 5.3. | Ensure international visibility of the Faculty |

## 9. EXPECTED OUTCOMES OF THE STRATEGIC PROGRAM OF SCIENTIFIC RESEARCH FOR THE PERIOD 2022- 2026

Taking into account the goals of the scientific research of the Faculty of Kinesiology Osijek, the following outcomes of the Strategic Program of Scientific Research for the period 2022-2026 were determined:

1. Received a permit to perform scientific activities in the field of Social Sciences

Obtaining a permit to perform scientific activities in the field of Social Sciences would enable the Faculty to enter the Register of Scientific Organizations. This would allow the Faculty to compete in tenders of the Croatian Science Foundation, as well as in other tenders that require the institution's registration in the Register of Scientific Organizations. This will result in more successful scientific research work of the Faculty as well as strengthen its importance at the national and international level.

2. Increasing scientific productivity of Faculty employees

The increase in the scientific productivity of Faculty employees will be manifested through an increase in scientific publication in journals indexed in the WoSCC and Scopus scientific databases, and in particular through an increase in publication in journals of the first and second quartile (Q1 and Q2) with a high impact factor. In addition, the increase in the scientific productivity of the Faculty's employees will be manifested in a greater number of participation in renowned international conferences, which includes invited lectures, but also in realized participation in international research groups, which will result in co-authorship with authors from foreign scientific organizations.

3. Increasing the Faculty's project activity on competitive scientific projects

The increase in the Faculty's project activity will be manifested through an increase in successful applications to national and international tenders for scientific projects, as well as the realization of partnerships with other international scientific organizations that work scientifically in the field of kinesiology and related sciences. Also, it is expected that when the Office for Projects starts functioning, the process of application and management of scientific projects will be facilitated, which will result in greater success of the Faculty in the aforementioned area.

4. Improvement of the infrastructure for scientific research activities of the Faculty

The improvement of the infrastructure for scientific research activities of the Faculty will be manifested through establishing and equipping of scientific laboratories, but also the provision of spatial capacities and the increase of the value of scientific equipment. This will create the conditions for additional improvement of scientific productivity and international visibility of the Faculty, as well as the later establishment of new studies and the attraction of scientists and students from abroad.

5. Greater international visibility and activity of the Faculty

The greater international visibility of the Faculty will be manifested in the increase of successful cooperation with foreign scientific institutions through the joint performance of scientific activities, participation in scientific projects, as well as the increase in the mobility

of researchers. The result will be greater competitiveness of the Faculty in attracting funding from the EU and other external sources.

6. Strengthened cooperation with the local community and other components of the University

Strengthened cooperation with the local community and other components of the University will result in a greater number of research projects and the transfer of knowledge and competences. This will bring prosperity to the local environment in which the Faculty operates, including sports organizations, the education system, as well as the possibility of implementing knowledge and skills in the real sector.

## 10. ORGANIZATIONAL DEVELOPMENT PLAN

*The Faculty of Kinesiology Osijek was founded in 2020, while the current organizational structure is applied from October 2021. In the next five-year period, the Faculty aims to strengthen its potential both in the field of scientific activity and in the field of human, material and infrastructural resources.*

*By establishing a whole series of organizational units, we will work on securing the infrastructure for scientific research activities. The establishment of the Sports Diagnostic Center will ensure the necessary prerequisites for the institution's scientific development, while the commercial activities of the center will provide financial conditions for further scientific development and improvement of the quality of the center's equipment. In addition to the Sports Diagnostic Center, for the purpose of even more active scientific development of the institution, a Center for Notation Analysis, a laboratory for human motor skills, and a laboratory for interdisciplinary research will be established.*

The establishment of the library ensured the conditions for continuous procurement of the library fund and access to scientific bases for all students and faculty employees. In the coming period, the plan is to provide an adequate IT classroom for working with students. These activities are necessary for the inclusion of students in scientific and professional activities, which creates the basis for the increased scientific activity of employees.

Organizational development in the context of human resources will accompany the increase of young scientists. By providing assistance, encouragement and support to teachers in the associate profession, the plan is to create preconditions for their advancement within the legal deadlines and thus increase the number of people in the scientific-teaching position.

Strengthening infrastructure resources is a priority of the Faculty's organizational development in the coming period. The establishment of all planned organizational units must necessarily be accompanied by the provision of infrastructure conditions for

implementation. In this context, the Faculty Administration will provide additional infrastructure resources either at the Faculty location or at separate locations in cooperation with the University.

Investment of material resources in scientific research activity is necessary for increasing the scientific production of the Faculty. For this purpose, the Faculty plans to continue investing through a constant increase in the funds allocated for the scientific production of professors on an annual basis and the purchase of equipment.

## 11. SUCCESS INDICATORS OF THE IMPLEMENTATION OF THE STRATEGIC PROGRAM OF SCIENTIFIC RESEARCH FOR THE PERIOD 2022-2026

| STRATEGIC GOAL 1:<br>To create a stimulating, multidisciplinary and interdisciplinary scientific environment with the goal of achieving scientific recognition and excellence | | | |
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| **Measure 1.1.**<br>Monitor the quality and ensure the conditions for the scientific research activity of the Faculty | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| **1.1.1.**<br>Preparation of the study and initiation of the procedure for the initial accreditation of the performance of scientific activities | The study was prepared and the procedure for the initial accreditation of scientific activity was initiated | Faculty Management | July 2022 |
| **1.1.2.**<br>Obtaining a permit to perform scientific activity | Received permit to perform scientific activity | Faculty Management | December 2022 |
| **1.1.3.**<br>Monitoring the scientific productivity of Faculty employees | Creation of annual plans on scientific research activities of employees | Vice dean for science and international cooperation;<br>Departments and sub-departments;<br>Office for the Improvement and Quality Assurance of Higher Education | December each year |
| | Preparation of the annual report on the realization of the scientific research activities of the employees | Vice dean for science and international cooperation;<br>Departments and sub-departments;<br>Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Drafting of the Regulations on | Faculty Management | June 2022 |

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| | rewarding the scientific excellence of employees and financing the scientific research activities of employees | | |
| **Measure 1.2.**<br>Encourage the publication of scientific papers in journals that are indexed in the WoSCC and Scopus databases, especially in journals that, according to the impact factor, belong to the Q1 and Q2 categories | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| **1.2.1.**<br>Increasing the number of published papers in top and other respectable international journals | Number of papers published in journals indexed in WoSCC and Scopus databases in the previous calendar year | Vice dean for science and international cooperation;<br>Faculty library;<br>Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Total number of citations of papers indexed in WoSCC and Scopus in the previous calendar year | Vice dean for science and international cooperation;<br>Faculty library;<br>Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Total and average impact factor of journals according to JCR in which papers were published in the previous calendar year | Vice dean for science and international cooperation;<br>Faculty library;<br>Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of scientific papers in the previous calendar year published in journals that according to the impact factor belong to Q1 and Q2 quartiles | Vice dean for science and international cooperation;<br>Faculty library;<br>Office for the Improvement and | February each year |

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| | | Quality Assurance of Higher Education | |
| **Measure 1.3.**<br>Encouraging applications for scientific projects, especially competitive projects, and providing institutional support for the application and implementation of projects | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 1.3.1.<br>Increasing the number of successful applications for scientific projects | Number of applications for scientific projects in the past calendar year funded from external sources | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of approved scientific projects in the previous calendar year financed from external sources | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of approved international scientific projects in the past calendar year | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of inter-institutional research projects at the University level in the past calendar year | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of institutional research projects in the past calendar year | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |

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| | Number of students involved in institutional research projects | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| **1.3.2.** Increasing the amount of funds for the scientific activity of the Faculty | Amount of granted funds for scientific projects in the previous calendar year from external funding sources | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| | Amount of funds spent on institutional internal research projects in the previous calendar year | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| **1.3.3.** Providing administrative support for the application and implementation of scientific projects | Office for projects established | Faculty Management | December 2022 |
| | Conducting workshops for informing about tenders and project application and implementation | Office for projects | Twice a year from 2023 |
| **1.3.4.** Institutionalization of the system of | Defined system of application and implementation of project activities | Faculty Management | March 2023 |

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| project activities implementation | | | |
| **Measure 1.4.**<br>Increasing the number of scientists and strengthening the young scientific staff | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| **1.4.1.**<br>Increasing the number of employees in scientific professions | Number of employees in scientific titles employed at the Faculty | Dean;<br>Vice dean for science and international cooperation;<br>Professional services;<br>Office for the Improvement and Quality Assurance of Higher Education | December each year |
| | Number of promotions of employees in scientific titles | Dean;<br>Vice dean for science and international cooperation;<br>Professional services;<br>Office for the Improvement and Quality Assurance of Higher Education | December each year |
| **1.4.2.**<br>Strengthening young scientific staff | Number of doctoral students employed at the Faculty | Vice dean for science and international cooperation;<br>Professional services;<br>Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of postdoctoral researchers employed at the Faculty | Vice dean for science and international cooperation;<br>Professional services;<br>Office for the Improvement and | February each year |

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| | | Quality Assurance of Higher Education | |
| | Number of defended doctoral dissertations of Faculty employees | Vice dean for science and international cooperation; Professional services; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of papers published in co-authorship with students of the Faculty | Vice dean for science and international cooperation; Professional services; Office for the Improvement and Quality Assurance of Higher Education | February each year |

| STRATEGIC GOAL 2: Improve and maximize the human and material resources of the Faculty for the purpose of national and international recognition and excellence | | | |
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| Measure 2.1. Ensuring the dissemination of the results of scientific research activities | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 2.1.1. Increasing visibility through participation in national and international scientific conferences | Number of participations in national scientific conferences | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of participations in international scientific conferences | Vice dean for science and international cooperation; Office for the Improvement and | February each year |

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| | | Quality Assurance of Higher Education | |
| **2.1.2.** Providing funding for participation in scientific conferences | Amount of funds for attending scientific conferences | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| **Measure 2.2.** Encouraging involvement in international research groups | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| **2.2.1.** Increasing the international scientific activity of the Faculty staff | Number of papers published in co-authorship with scientists from foreign institutions | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of participations in international scientific projects | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| **Measure 2.3.** Starting our own journal and scientific conference | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| **2.3.1.** Launch of the scientific journal of the Faculty | The first issue of the journal was published | Faculty Management; Publishing Committee; Library | June 2023 |
| **2.3.2.** | Organization of the first scientific | Faculty Management | May 2023 |

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| Initiation of the scientific conference of the Faculty | conference of the Faculty | | |
| 2.3.3. Co-organization of an international scientific conference | Number of co-organizations of international scientific conferences | Faculty Management | February each year |
| 2.3.4. Launch of a student conference | Organization of the first student conference | Faculty Management; Students' Assembly | May 2025 |

| STRATEGIC GOAL 3: Connect with the local community with the aim of implementing joint research activities that will result in the development of society and the popularization of science | | | |
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| Measure 3.1. Connecting with the local community on joint scientific research projects | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 3.1.1. Implementation of joint scientific research projects with the local community | Number of joint projects with the local community | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| 3.1.2. Scientific productivity in which the local community is involved | Number of scientific publications resulting from projects with the local community | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |
| | Number of students' final and graduate theses resulting from cooperation with the local community | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | February each year |

| Measure 3.2.<br>Connecting with the local community through activities of dissemination of knowledge and competencies | | | |
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| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 3.2.1.<br>Organization of educational activities (workshops, seminars, round tables and lectures) for the local community | Number of organized educational activities (workshops, seminars, round tables and lectures) for the local community | Vice dean for science and international cooperation;<br>Office for the Improvement and Quality Assurance of Higher Education | February each year |
| **Measure 3.3.**<br>Participation in science popularization activities | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 3.3.1.<br>Increasing science popularization activities | Participation in science popularization activities organized by the Faculty, University and other stakeholders | Vice dean for science and international cooperation;<br>Office for the Improvement and Quality Assurance of Higher Education | February each year |

| STRATEGIC GOAL 4:<br>Provide material and organizational infrastructure for the scientific research activity of the Faculty | | | |
|---|---|---|---|
| **Measure 4.1.**<br>Establishment and equipping of scientific laboratories | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 4.1.1.<br>Establishment of scientific and professional laboratories and the Sports Diagnostic | Organized and equipped center for notational analysis | Faculty Management | June 2022 |
| | Organized and equipped scientific | Faculty Management | June 2023 |

| | | | |
|---|---|---|---|
| Center in accordance with the Sports Strategy of the town of Osijek | laboratory for human motor skills | | |
| | Organized and equipped scientific laboratory for interdisciplinary research | Faculty Management | May 2024 |
| | Organized and equipped laboratory for testing athletes | Faculty Management | May 2025 |
| **4.1.2.** Procurement of scientific equipment | Value of purchased scientific equipment in the previous calendar year | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| | Number of devices in the category of capital scientific equipment | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| | The value of medium and small value scientific equipment purchased in the past calendar year | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and | March each year |

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|---|---|---|---|
| | | Quality Assurance of Higher Education | |
| | The number of devices in the category of equipment of medium and low value | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| **Measure 4.2.**<br>Improving the IT and library resources of the Faculty | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| **4.2.1.**<br>Increasing the library materials and the availability of scientific databases | Number of books purchased in the previous calendar year for teaching and research activities | Library;<br>Office for the Improvement and Quality Assurance of Higher Education | January each year |
| | Number of subscriptions to scientific databases, online journals and online book databases | Faculty Management;<br>Library;<br>Office for the Improvement and Quality Assurance of Higher Education | January each year |
| **4.2.2.**<br>Improving the IT resources of the Faculty | Value of purchased IT equipment in the previous calendar year | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; | March each year |

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| | | Office for the Improvement and Quality Assurance of Higher Education | |
| | Value of purchased computer programs for scientific activity | Vice dean for science and international cooperation; Vice dean for development, professional work and business relations; Office for the Improvement and Quality Assurance of Higher Education | March each year |

| STRATEGIC GOAL 5:<br>Connect with similar institutions in the European Research Area with the goal of implementing joint research activities that will result in international recognition and top scientific achievements | | | |
|---|---|---|---|
| Measure 5.1.<br>Develop a stimulating environment for international mobility of scientists and staff | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 5.1.1.<br>Increasing outgoing mobility | The number of outgoing mobilities of scientists and staff of the Faculty | Vice dean for science and international cooperation; Erasmus coordinator; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| 3.1.2.1.<br>Increasing incoming mobility | Number of incoming mobility of foreign scientists to the Faculty | Vice dean for science and international cooperation; Erasmus coordinator; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| Measure 5.2. | | | |

| Involvement in international activities by connecting with institutions from the region and the European Research Area | | | |
|---|---|---|---|
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 5.2.1. Increasing the number of Erasmus + and similar mobility agreements | Number of signed Erasmus + and similar mobility agreements | Vice dean for science and international cooperation; Erasmus coordinator; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| 5.2.2. Increasing the number of signed bilateral agreements on cooperation between the Faculty and institutions abroad | Number of signed bilateral agreements on cooperation between the Faculty and institutions abroad | Dean; Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| 5.2.3. Increasing the number of participation in international research groups | Number of participation in international research groups | Vice dean for science and international cooperation; Erasmus coordinator; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| Mjera 5.3. Ensuring the international visibility of the Faculty | | | |
| Activity | Performance indicator | Executive authorities | Activity dynamics |
| 5.3.1. Encourage study stays at foreign scientific institutions for the purpose of conducting research | Duration of stay at foreign scientific institutions | Vice dean for science and international cooperation; Erasmus coordinator; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| 5.3.2. | Creating employee profiles on Google Scholar and | All employees in teaching-scientific, | March 2022 |

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|---|---|---|---|
| Ensuring the scientific visibility of employees | ResearchGate portals and creation of ORCID profiles and online repositories of scientific papers | teaching and associate professions; Library | |
| 5.3.3. Encouraging employees to join international organizations and bodies | Number of employees in the management structure in international organizations and bodies | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | March each year |
| | Number of employees who are members of international organizations and bodies | Vice dean for science and international cooperation; Office for the Improvement and Quality Assurance of Higher Education | March each year |