# Optimizing the annual training cycle for swimmers at the specialized basic training stage

https://doi.org/10.65149/eajss.2025.v5i12.a015

[1]Islamov Izzatilla Sunnatovich
[1]Uzbekistan state university of physical education and sport, Chirchik, Uzbekistan

**Abstract**
This article examines the optimization of the annual training cycle for swimmers at the specialized basic training stage through the systematic planning, monitoring, and adjustment of training loads using the “Talant ID” and “eCoach” electronic programs. Particular attention is given to the development of an evidence-based approach to organizing the training process, taking into account the age-related characteristics of swimmers, their individual physical and functional capacities, technical preparedness, and the specific demands of swimming. The study focuses on the effective distribution of training loads in terms of volume, intensity, and recovery throughout the annual macrocycle, including the planning of microcycles and mesocycles. Furthermore, the application of digital technologies enables coaches to monitor athletes’ training progress, evaluate the effectiveness of training sessions, identify individual performance trends, and make timely adjustments to training plans. The integration of “Talant ID” and “eCoach” into the training process is considered a promising approach to improving the quality of training management, enhancing the consistency of training load distribution, and supporting the long-term development of young swimmers. The proposed approach aims to increase the scientific validity of training planning, improve the effectiveness of the annual preparation cycle, and create favorable conditions for the progressive development of swimming performance.

**Keywords:** swimming, swimmer, specialized basic training stage, annual training cycle, training process, training load, training volume, training intensity, digital technologies, “Talant ID”, “eCoach”, microcycle, mesocycle, macrocycle, training planning, load monitoring, individualization, optimization, sports performance.

## Introduction

The primary objectives of the general preparatory period in elite sports include building a solid foundation of physical fitness, significantly increasing the level of power, capacity, and efficiency of aerobic performance, and boosting maximum muscle strength and strength endurance in aerobic and aerobic-anaerobic modes. During the special preparatory stage of the preparatory period, training is aimed at enhancing special work capacity. This is achieved through the extensive use of special preparatory exercises that closely resemble competitive ones, as well as the competitive exercises themselves. In the water, special attention is paid to intensive developmental loads that are anaerobic-aerobic and anaerobic-glycolytic in nature. On land, exercises are used to improve speed-strength qualities and special strength endurance. The training program involves developing a complex of qualities (speed, special endurance, etc.) based on the foundation laid during the general preparatory stage. Within the total volume of training work, a significant role is given to highly focused methods that help improve the quality of individual components of special performance.

*Research Objective.* To optimize the annual training cycle for swimmers at the specialized basic training stage by planning annual training loads using the "Talant ID" and “eCoach” software programs.

*Research Tasks:*

- to create a database of functional and competitive performance indicators for swimmers at the specialized basic training stage;
- to develop a classification of training loads by intensity zones for swimmers at the specialized basic training stage;
- to develop a model for planning annual training loads for swimmers at the specialized basic training stage, based on the "Talant ID" and "eCoach" electronic programs;
- to experimentally substantiate the effectiveness of the annual training load planning model, which was developed using a database of swimmers' functional and competitive performance indicators.

The scientific novelty of the research is as follows:

the possibilities for the rational planning of annual training loads have been expanded by determining the volumes of various types of training loads and optimal time windows for swimming distances in the current season. This was achieved by uploading a database into the "Talant ID" electronic system, which was compiled based on the dynamics of sports results over the last three years, the relative endurance coefficient, maximum heart rate, and

**Table 1. Classification of loads by intensity zones for middle-distance freestyle swimming**

| Intensity Zones | Load Focus | Load Intensity, % of Max HR | Load Volume (meters) | Load Volume (min) | Work-to-Rest Ratio (seconds) | Example Sets |
|---|---|---|---|---|---|---|
| I | Aerobic recovery, special strength, and technical training in an aerobic mode | up to 70 | ≥4000 | ≥60 | - | technique swimming |
| II | Development of basic endurance | 71 - 80 | 1500 - 4000 | ≥15 | 10 - 30 | 6-10 x 400 m, 10 s rest |
| III | Development of special distance endurance | 81-90 | 800 - 2000 | 10 - 40 | 25 - 40 | 4-6 x 300 m, 15 s rest |
| IV | Development of special competitive endurance | 91-100 | 200 - 600 | 4 - 12 | 120 - 140 | 4 x 75 m, 3-4 minutes rest, or 6 x 50 m, 2 minutes rest |
| V | Developing speed and starting power | Max | 25–100 | 1–2 | 130–180 | 4-6 x 15 m from the start, 1 minute rest, or 6-8 x 12.5 m, 45 |

anaerobic threshold indicators of swimmers at the specialized basic training **stage;**

The possibilities for systematizing the training process for swimmers specializing in the 200-meter freestyle have been expanded by developing a classification of training loads by intensity zones (relative to maximum heart rate), aimed at developing special strength, special distance endurance, special competitive endurance, speed, and starting power.

**Research Methodology.** Based on a generalization of experimental results from studying the competitive activity of qualified athletes in the 200 m swim, and drawing on data from specialized literature about the focus of training loads in various sports, a load classification for swimmers specializing in the 200 m distance was developed (Table 1).

Since the first and second zones are considered aerobic, they are often combined.

In this case, the energy zones are divided into four: aerobic, mixed, anaerobic, and alactic (creatine phosphate).

Swimming sets in these zones depend on rest intervals and intensity.

The classification of four energy zones with rest intervals of 15 to 20 seconds is presented in Tables 2 and 3. If the rest interval is longer (30 to 40 seconds), swimmers can maintain a high intensity for longer in the same energy zone.

**Table 2. Training sets with a rest interval of 15-20 seconds**

| Set distance | V zone | IV zone | III zone | I-II zone |
|---|---|---|---|---|
| | | **Number of repetitions** | | |
| 25 | 1-3 | 4-16 | 18-60 | 62 or more |
| 50 | 1 | 2-7 | 8-26 | 27 or more |
| 75 | | 1-4 | 5-16 | 17 or more |
| 100 | | 1-3 | 4-12 | 13 or more |
| 150 | | 1-2 | 3-8 | 9 or more |
| 200 | | 1 | 2-6 | 7 or more |
| 400 | | | 1-3 | 4 or more |

**Table 3. Training sets with a rest interval of 30-40 seconds**

| Set distance | SP3 (zone 5) | SP1-2 (zone 4) | EN2-3 (zone 3) | EN1 and REC (zones 1-2) |
|---|---|---|---|---|
| | | Number of repetitions | | |
| 25 | 1-5 | 6-20 | 22-70 | 72 or more |
| 50 | 1 | 2-9 | 10-32 | 33 or more |
| 75 | | 1-6 | 8-21 | 22 or more |
| 100 | | 1-4 | 5-15 | 16 or more |
| 150 | | 1-3 | 4-10 | 11 or more |
| 200 | | 1-2 | 3-7 | 8 or more |
| 400 | | | 1-4 | 5 or more |

## Results and discussion

Using these tables, coaches can select any swimming sets in all energy zones. For example, if athletes need to swim 300 m in anaerobic energy zones, the coach can choose training sets according to Tables 2 and 3: 12 x 25 m with 15-30 seconds of rest, 6 x 50 m with 15-30 seconds of rest, 4 x 75 m with 15-30 seconds of rest, and so on.

To determine the level of the aerobic energy supply mechanism in swimmers, we conducted tests for the anaerobic threshold (AT) and maximum heart rate (MHR). An increase in the anaerobic threshold (AT), which is an important indicator, is facilitated by a decrease in blood lactate levels. This threshold signifies a load level at which the concentration of lactic acid in the blood exceeds 4 mmol/l. The anaerobic threshold (AT) is a criterion that reflects the body's aerobic capacity and is directly related to performance in endurance-based sports. Another important indicator of aerobic capacity is the maximum heart rate. This indicator is considered a factor that determines cardiac performance in skilled athletes. The results of the control treadmill test for the subjects in the experimental and control groups were determined at the beginning and end of the study (Table 4).

At the beginning of the study, no statistically significant differences were observed between the results obtained in each group ($p>0.05$). At the end of the study, the anaerobic threshold (AT) for the subjects in the experimental group was 184.7 bpm, and the maximum heart rate (MHR) was 197.7 bpm. For the subjects in the control group, these indicators were 179.1 bpm and 191.7 bpm, respectively. This indicates the presence of statistically significant differences between the indicators of the experimental and control groups. The indicators for the subjects in the

**Table 4. Dynamics of anaerobic threshold (at) and maximum heart rate (mhr) in the experimental and control groups at the beginning and end of the pedagogical experiment**

| No. | Indicators | | EG | | t | p | CG | | t | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Start | End | | | Start | End | | |
| | | | $\bar{x}\pm\sigma$ | $\bar{x}\pm\sigma$ | | | $\bar{x}\pm\sigma$ | $\bar{x}\pm\sigma$ | | |
| 1 | Treadmill | MHR | 189.7±5.2 | 197.7±4.3 | 2.01 | <0.05 | 190.4±5.0 | 191.7±6.4 | 1.68 | >0.05 |
| | | Anaerobic threshold | 175.7±7.0 | 184.7±4.6 | 2.10 | <0.05 | 176.7±7.2 | 179.1±6.8 | 1.45 | >0.05 |

experimental group were superior to those of the control group ($p<0.05$).

Thus, the analysis of the study results demonstrates the high effectiveness of our developed load distribution and the applied methodologies for planning training loads of various focuses within the annual training cycle for qualified swimmers specializing in the 200-meter freestyle.

## Conclusion

An analysis of scientific literature and sources on the topic of this dissertation, along with pedagogical observations and the results of the research and pedagogical experiments conducted, have led to the following conclusions.

1. The training load classification system, developed based on pedagogical and bioenergetic criteria, encompasses five intensity zones. This system allows for the differentiated organization of the training process on a scientific basis and serves to optimize exercises in the following areas:

***Zone 1:*** *restoring special work capacity and activating regeneration processes;*

***Zone 2:*** *developing general (aerobic) endurance;*

***Zone 3:*** *developing special distance endurance;*

***Zone 4:*** *improving competitive endurance;*

***Zone 5:*** *increasing speed, start reaction, and maximum power.*

## References

Zelenin, L.A., & Medvedkov, V.D. (2011). A new simulator for improving the safety, balance, and technical preparedness of rowers. *Uchenye zapiski universiteta im. P.F. Lesgafta*, *7* (77), 76-80. (0.74/0.15)

Ikramov, B.F. (2019). The "KAYAK BALANCE TRAINING ERGOMETER" innovative trainer for developing balance in young kayakers. In *BBK 60 S 56* (p. 27).

Ikramov, B.F. (2019). Unconventional development of on-land balance in young kayakers. In *BBK 60 A 43* (p. 99).

Farkhodovich, I.B. (2020). Development of balance in young kayakers at the initial stage of training. European Journal of Research and Reflection in Educational Sciences. Vol. 8, No. 2. pp. 66-70.

Islamov I. S., Ikramov B. F. Starting actions of kayakers and canoeists // Academic research in educational sciences. – 2021. – Vol. 2. – No. 6. – pp. 1442-1450.

Ikramov F. T., Azimov Z. N. Features of using a rowing pool // Academic research in educational sciences. – 2021. – Vol. 2. – No. 6. – pp. 1154-1159.

## AUTHOR BIOGRAPHY:



**Izzatilla Sunnatovich ISLAMOV**

**Employment**
Lecturer at Uzbekistan state university of physical education and sports

**Degree**
PhD

**Research interests**swimming, aqua sports, young athletes, physical education and sport, Theory of physical education, Analyzing of sport competitions.