

THE MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL TECHNICAL UNIVERSITY  
«KHARKIV POLYTECHNIC INSTITUTE»

**PHYSICAL EDUCATION**

Guidelines to independent work

for full-time students of all specialities of NTU 'KhPI'

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Guidelines to independent work for the discipline «Physical education» for full-time students of all specialities of NTU 'KhPI' / Dev.: O. V. Bilous, O. O. Poliakova, O.V. Yushko – Kharkiv: NTU «KhPI», 2025. – 20 p.

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## **INTRODUCTION**

The student's independent performance of tasks consists in preparing and submitting the results of work to the tutor for control during the classes.

The tasks completed by the student are submitted to the tutor for control in the following form: you should send Workbook in Word format for verification.

To ensure effective independent work, the student is provided with consultations and control of each stage of preparation.

The results of the student's independent work are evaluated in points, which are included in the overall final grade.

## **1 RECOMMENDATIONS FOR PREPARING A WORKBOOK**

You should to fill in the Workbook by completing 2 tasks. The first task is about organizing food in relation to training, and the second task is about calculating your heart rate. Before completing the tasks, you should carefully study the theoretical materials on the topics provided in this guidelines. After that, complete the tasks about food, based into gained theoretical knowledge. And then do the pulse task – you do the pulse task about yourself! Please note that it will take 10 days to determine your resting heart rate, so please allow yourself time – the recommended time to complete the Workbook is about two weeks. The Workbook should be sent in Word format with your name, surname, and group in the file name. For example: ROMASHKA\_ANDRIY\_CGT125.

## 2 WORKBOOK

This workbook was completed by a student:

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(your name and surname)

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(your group)

Date of sending for checking:

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Dear student, fill out this Workbook and send for checking to get a grade. Also use this knowledge in life, it will help you stay healthy and train profitably!

**1. Correct selection of food before and after training. And best food choices throughout the day.**

It is necessary to eat before training in that way that the food has time to digest in the stomach before the training is start.

Look at the table and choose your variant.

Table 1 – Time of digestion of food in the stomach

Food	Time
Fruits	Up to 40 minutes
Vegetables	Up to 40 minutes
Vegetables with oils (salad)	Up to 90 minutes
Milk	2 hours
Cereals	Up to 90 minutes
Nuts, seeds, legumes	Up to 3 hours
Eggs	45 minutes
Fermented milk drinks	1 hour
Cottage cheese, white cheese	2 hours
Cheese (yellow)	4 hours
Fish	Up to 90 minutes
Chicken	3 hours
Meat (pork, beef)	Up to 5 hours
Potatoes, pumpkin	Up to 2 hours
Water	Enters the intestines almost immediately

After training it is better not to eat first 20 minutes. After 20 minutes it is good to eat fruits. 40 minutes after fruits you can eat and other food.

The following products are best for breakfast:

- 1) Omelet + vegetables;
- 2) Cereals (except rice) + eggs + vegetables;
- 3) Cereals (except rice), they can be mixed with dried fruit, but not with fresh fruit (fresh fruit, ideally, is a separate food)!;
- 4) Cottage cheese (can be with honey);
- 5) Macaroni and cheese;
- 6) Fish with cereals and vegetables;
- 7) Cereals (except rice) + white cheese + vegetables.

Any food is suitable for lunch. Therefore, it is logical to eat for lunch what is more difficult to digest at other times, alternating with other food. Food that is well digested only at the middle of the day: legumes, rice, red meat (it is better to eat it no more than three times a week, replacing it with white meat, fish, eggs on other days), potatoes. All food is suitable for lunch, the main thing is to take into account the time of digestion in the context of the following training, if there is one.

The following products are best for dinner:

- 1) Fish, seafood + vegetables (fresh or baked);
- 2) Buckwheat with vegetables (fresh or baked), you can also with cheese;
- 3) Cottage cheese with sour cream.

The best drink after food is warm water or water with room temperature.

Snacks: fruits, yogurts, nuts.







## 2. Training pulse

Firstly, you should find your resting heart rate. This yours pulse when you wake up. Before getting out of bed you calculate the numbers of heart beating per minute.

Fill in the table with your resting heart rate (heart rate in the morning after waking up, measured without getting out of bed). Measured in beats per minute. You need to count three times to measure the correctly. Make such counting during 10 days. Every day write your result in table.


Now find smallest number which repeated.

Write here this number \_\_\_\_\_. It is your "morning pulse". Or also it calls "resting heart rate".

After this you can calculate yours individual appropriate pulse for training tasks. It is will depends of your age, morning pulse and your physical conditional (are you a sportsmen, or not).

Every pulse gives special effects to your body. And not every pulse allowed for everybody. For training with high pulse person should preparing a lot of years.

For finding appropriate for you training pulse you have 2 formulas:

$$\text{max pulse} = 205.8 - (0.685 \times \text{age})$$

$$\text{pulse of task} = (\text{max pulse} - \text{"morning pulse"}) \times \text{intensity} + \text{"morning pulse"}$$

Intensity you will find in table. Intensity depends on your physical conditional (are you a sportsmen, or not) and desired effect from exercise.

Table 2 – Intensity

Desired effect from exercise	Intensity
<p>1) For persons who are not a sportsmen. You have to training at pulse not higher that with this intensity in order to exercise do not give extra tension on the heart.</p> <p>2) For every persons while warming up pulse should not be higher that with this intensity.</p> <p>3) For every persons while morning exercise pulse should not be higher that with this intensity.</p> <p>4) For sportsmen to check recovery. Even after very difficult exercise after 1 minute of rest your pulse should be less than with this intensity.</p>	0,6
<p>1) For persons who wants to strengthen the cardio respiratory system. Only some exercise with such intensity (at the middle of training under control of trainer).</p> <p>2) For persons who wants loose weight. Only some exercise with such intensity (at the middle of training under control of trainer).</p>	0,6-0,7
<p>Only for professional sportsmen!!! Sportsmen use for make heart and lungs bigger, make number of mitochondria bigger and amount of ferments in them bigger. Only under control of trainer!</p>	0,7-0,8
<p>Only for professional sportsmen!!! Sportsmen use for make body more resist to lactic acid, for biggest amount of glycogen, for make muscles bigger. Only under control of trainer!</p>	0,8-0,9
<p>Only for professional sportsmen!!! Sportsmen use to develop maximum strength and speed. Only under control of trainer!</p>	0,9-1





If you are a sportsmen – calculate here pulse with every intensity (0,6-1).  
Use 2 formulas. Formulas above the table 2.

$$\text{max pulse} = 205.8 - (0.685 \times \underline{\quad}) =$$

$$\text{pulse of task} = (\underline{\quad} - \underline{\quad}) \times 0,6 + \underline{\quad} =$$

= \_\_\_\_\_ heart beating per minute

$$\text{pulse of task} = (\underline{\quad} - \underline{\quad}) \times 0,7 + \underline{\quad} =$$

= \_\_\_\_\_ heart beating per minute

$$\text{pulse of task} = (\underline{\quad} - \underline{\quad}) \times 0,8 + \underline{\quad} =$$

= \_\_\_\_\_ heart beating per minute

$$\text{pulse of task} = (\underline{\quad} - \underline{\quad}) \times 0,9 + \underline{\quad} =$$

= \_\_\_\_\_ heart beating per minute

$$\text{pulse of task} = (\underline{\quad} - \underline{\quad}) \times 1 + \underline{\quad} =$$

= \_\_\_\_\_ heart beating per minute

Calculate how much will be per 10 seconds:

\_\_\_\_\_ heart beating per 10 seconds.

After exercise pulse should be calculated per 10 seconds, so you need to know this number in order to control your training.

Now you know yours different diapasons of pulse for different effects. But your trainer should chose for you appropriate time of each exercise! Do under professional control.

Take care of yourself!!! =)



## LIST OF INFORMATION SOURCES

1. Методичні вказівки до практичних занять з навчальної дисципліни "Основи теорії здоров'я та здорового способу життя" [Електронний ресурс] : для студентів спец. 017 "Фізична культура і спорт" освітнього рівня – бакалавр / уклад.: О. В. Білоус ; Нац. техн. ун-т "Харків. політехн. ін-т". – Електрон. текст. дані. – Харків, 2023. – 38 с.

URI: <https://repository.kpi.kharkov.ua/items/8fbedbc-d03e-460b-b476-40cf5266530a>

2. National health as determinant of sustainable development of society. Editors: Nadiya Dubrovina, Stanislav Filip. Authors: Olesia Bilous, Serhii Hrdzelidze, Svitlana Shyriaieva and others. Monograph. School of economics and management in public administration in Bratislava, Bratislava, 2021, pp. 788. ISBN 978-80-89654-73-4. EAN 9788089654734.

URI: [file:///D:/Downloads/Mono\\_VSEMsMED2021%20\(1\).pdf](file:///D:/Downloads/Mono_VSEMsMED2021%20(1).pdf)

3. Attila Szabo Passion and addiction in sports and exercise: Routledge, New York, 2022.

URL: <https://www.routledge.com/Passion-and-Addiction-in-Sports-and-Exercise/Szabo-Demetrovics/p/book/9781032003009>

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