MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
Kyiv National University of Construction and Architecture

METHODOLOGY OF SCIENTIFIC RESEARCH

Methodical instructions
for tests of course «Methodology of scientific research»

for applicants of higher education by specialty 144 «Thermal power engineering»

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М54

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In the author's edition

Methodology of scientific research: methodical instructions for tests
М54 of the course "Methodology of scientific research" / prepared by: T. Kryvomaz, A. Tsyba, R. Hamotskyi, I. Ilchenko. – Kyiv: KNUCA, 2024. – 11 p.

Contains test tasks of the course "Methodology of scientific research" and instructions for their implementation.

For applicants of higher education by specialty 144 «Thermal power engineering».

Методологія наукових досліджень: методичні вказівки до виконання
М54 тестових завдань з дисципліни «Методологія наукових досліджень» / уклад.: Кривомаз Т., Циба А., Гамоцький Р., Ільченко І. – Київ: КНУБА, 2024. – 11 с.

Містять тестові завдання курсу «Методологія наукових досліджень» та інструкції до їх виконання.

Призначено для здобувачів вищої освіти за спеціальністю 144 «Теплоенергетика».

CONTENT

Introduction

Test tasks in the course "Methodology of scientific research" reflect the content of lectures and all answers to test questions are contained in the presentations. For the convenience of passing the tests, they are presented in the form of Google Forms, links to which are on the first slides of the presentations. Various options for choosing answers are offered, and a "circle" means one correct answer, and a "square" allows you to choose several options, in some questions all options may be correct. Tests can be taken at any time convenient for students after the lecture, but it is recommended to take the test before the start of the next lecture, as it helps to consolidate the course material. To successfully complete the tests, it is necessary to carefully listen to the lectures and thoroughly familiarize yourself with the text of the presentations.

The purpose of course – acquiring new practical skills in the application of principles.

Tasks of the course:

- evaluate systems and practical thinking;
- consider planning and time management;
- analyze analogical and deliberative thinking;
- compare critical and creative;
- to learn scientific skills;
- to develop writing skills.

As a result of mastering the course, students should:

- to know innovation;
- to be able to foreign language proficiency;
- to realize problem-solving;
- to understand instrumental scientific competences;
- master in computer skills.

Test № 1
Introducing to methodology of scientific research

1. What is Occam's principle? (*one correct answer*)

a) The important thing is not to stop questioning

b) In science, there are no shortcuts to truth

c) Entities must not be multiplied beyond necessity

d) Science is not only a disciple of reason but also one of romance and passion

2. What standard of evaluation of science is described by Karl Popper? (*one correct answer*)

a) flexibility

b) ambiguity

c) falsifiability

d) clarity

3. What are elements of scientific method? (*several correct answers*)

a) belief

b) hypotheses

c) predictions

d) experiments

4. What quantitative research measures? (*several correct answers*)

a) frequency

b) central tendency

c) dispersion or variation

d) abstraction

5. What qualitative research methods include? (*several correct answers*)

a) content analysis

b) narrative analysis

c) chaotic analysis

d) discourse analysis

Test № 2
Scientific competences

1. What indicators characterize the ability to think analytically? (*several correct answers*)

a) analyzing reading
b) quantitative and qualitative analyses
c) reasoning
d) blind faith

2. What indicators do NOT characterize the ability to think critically? (*one correct answer*)

a) trust in authorities
b) judgements analysis
c) practical implications
d) responsibility

3. What include analytical skills? (*several correct answers*)

a) data analysis
b) chaotic perception
c) interpreting
d) not communication

4. What indicators do NOT characterize the ability to think analogically? (*one correct answer*)

a) relating ideas
b) don’t using correspondences between ideas
c) finding novel solutions
d) knowledge transfer

5. How can a problem be approached practically? (*several correct answers*)

a) identify and define the problem
b) observe and identify resources
c) evaluate solution approaches
d) acting in a solution-oriented way

Test № 3
Scientific skills

1. What principes do NOT include time management? (*one correct answer*)

a) setting priorities
b) procrastination
c) estimate task duration
d) set SMART goals

2. What do NOT include problem-solving strategies? (*one correct answer*)

a) just forget
b) abstraction
c) brainstorming
d) morphological analysis

3. What are the indicators for decision-making? (*several correct answers*)

a) quality
b) commitment
c) logic
d) flowers

4. What types of cognitive biases could have people? (*several correct answers*)

a) cognitive inertia
b) selective perception
c) wishful thinking
d) optimism bias

5. How developing a learning orientation? (*several correct answers*)

a) never ask questions
b) be open to feedback
c) be curious
d) learn from your mistakes

Test № 4
Interpersonal and systemic generic competences

1. What techniques are recommended for self-motivation? (*several correct answers*)

a) develop a fixed mindset
b) do a self-evaluation
c) failures as learning opportunities
d) practice positive thinking

2. What are crucial conditions of diversity and interculturality? (*several correct answers*)

a) equal dignity of all
b) avoid dialogue
c) consider cultural differences
d) respecting cultural differences

3. What include adaptability skills? (*several correct answers*)

a) ability to change oneself
b) do not fit to occurring changes
c) collaboration
d) responsive to feedback

4. What does NOT meet ethical standards? (*one correct answer*)

a) truthful
b) fair
c) falsehood
d) honest

5. What is interpersonal communication? (*several correct answers*)

a) lack of interactions
b) an exchange of information between people
c) verbal and nonverbal cues to accomplish goals
d) unwillingness to understand each other

Test № 5
Final test

Assignment for the final assessment of the course «Methodology of scientific research» value 20 points, while current tests are worth a total of 80 points. The final assessment work is a short essay. This essay consists from 3 parts: introduction, main part, conclusions. In the introduction, justify the relevance of your essay and state its purpose. In the main part, analyze materials on the topic from the lecture course and express your opinion on this matter. The conclusion(s) should be formulated not declaratively, but fundamentally. Justify what and why. If you used sources other than the presentation text for your essay, list these information sources at the end of your essay. Completion time is one week.

Suggested essay topics:

- Important types of thinking in scientific research
- Key skills for scientific research
- Interpersonal competences which I would like to develop
- Systemic generic competences which I would like to develop
- Features of science in your country.

But also, it is possible to choose formulate a different topic if it is really interesting and is directly related to the course «Methodology of scientific research».

List of recommended sources

1. Presentations for the course of lectures «Methodology of scientific research»
2. *Devezer B.* The case for formal methodology in scientific refor / B. Devezer, D.J. Navarro, J. Vandekerckhove, E. Ozge Buzbas // Royal Society open science. –2021. – 8(3). – P. 200805.
3. *Gómez J.M.* Research methodology: An introduction. Modernizing the academic teaching and research environment: Methodologies and cases in business research / J.M. Gómez, S. Mouselli. – Berlin: Springer Cham, 2018 – 208 p.
4. *Sanchez A.V.* Competence-based learning. A proposal for the assessment of generic competences / A.V. Sanchez, M.P. Ruiz. – Bilbao: University of Deusto, 2008. – 335 p.
5. *Thomas C.G.* Research methodology and scientific writing / C.G. Thomas. – Thrissur: Springer, 2021. – 620 p.

Educational and methodical edition

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