Project Work

Specialty 113 – Applied Mathematics	**Institute** Institute of Computer Modeling, Applied Physics and Mathematics
Educational program Computer and Mathematical Modeling	**Department** Mathematical Modeling and Intelligent Computing in Engineering (161)
Level of education Master's level (1 year 4 months)	**Course type** Special (professional), Mandatory
Semester 2	**Language of instruction** English

Lecturers and course developers

Ksenia Potopalska (responsible lecturer)

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Candidate of technical sciences, associate professor of the department of mathematical modeling and intellectual calculations in engineering, work experience - 7 years. Author of more than 40 scientific and methodical works works. Leading lecturer on disciplines: "Modeling and reverse engineering based on data",
Modeling and reverse engineering based on of data", teacher of practice

Learn more about the teacher on the department's website

General information

Summary

The discipline aims to provide students with theoretical knowledge and practical skills in the organization and conduct of scientific research in the field of applied mathematics.

Course objectives and goals

The purpose of teaching the academic discipline " Project work" is to teach students to solve complex problems of a scientific and engineering research nature. Mastering new scientific results to supplement professional knowledge; to develop students' abilities for creative thinking; teach how to work with research literature; to inculcate in students the need for constant improvement of professional level in the process of practical activity. The study of this discipline forms social skills in students of education (soft skills): communication (implemented through: method of working in pairs and groups, work with information sources), teamwork (implemented through: project method), leadership skills (implemented through:
group work, project method).

Format of classes

Independent work. Final control - credit.

Competencies

Program competencies according to the educational program:

GC2. The ability to adapt and act in a new situation, to show initiative and entrepreneurship.

GC3. Ability to master modern knowledge, formulate and solve problems.

GC4. Ability to act socially, responsibly and consciously.

GC5. Ability to conduct professional activities, in particular in the international environment.

GC6. Ability to work in a team and lead it.

GC7. Ability to think abstractly, analyse and synthesise.

GC8. Ability to communicate and carry out professional activities in the state language and the language of the EU countries.

PC1. Ability to solve tasks and problems that can be formalised, require updating and integrating knowledge, in particular in conditions of incomplete information.

PC2. Ability to conduct scientific research aimed to develop new and adapt existing mathematical and computer models to study various processes, phenomena and systems, conduct appropriate experiments and analyse the results.

PC9. The ability to mathematically formalise the formulation of scientific and practical problems, to choose a mathematical analytical or numerical method of its solution, which ensures the required accuracy and reliability of the result.

Learning outcomes

Program learning outcomes according to the educational program:

LO2. Collect, systematize and analyse scientific and technical information on professional activities.

LO3. Logically, consistently and accurately formulate their thoughts and present information in professional communication, apply information and technical means and pedagogical methods to present the results of scientific, applied and IT projects.

LO9. Be able to analyse and design systems with large amounts of data, apply and adapt methods of knowledge acquisition, methods of evaluation and interpretation of the found patterns.

LO11. Possess skills of abstract thinking, analysis and synthesis.

LO12. To be able to work in a team, develop and manage research, applied and IT projects, potentially in an international environment.

LO13. Have knowledge in preparing scientific and technical reports on completed design or research work and in implementing the results of research and development.

Student workload

The total scope of the discipline is 90 hours. (3 credits ECTS): independent work – 90 hours.

Course prerequisites

Fundamentals of scientific research, Innovative entrepreneurship and start-up project management, Modelling in CAE systems, Nonlinear mechanics of a solid deformable body

Features of the course, teaching and learning methods, and technologies

work, peer-to-peer, cases, use of online tools for collaborative work on a software product, use of SCRUM methodologies.

Program of the course

Topics of the lectures

There are no classes.

Topics of the workshops

There are no classes.

Topics of the laboratory classes

There are no classes.

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Self-study

Work on a project on a relevant topic in a team or individually

Course materials and recommended reading

Main literature

1.°Hunt A., Thomas D., Safari . T he Pragmatic Programmer : Your Journey that Mastery , 20th Anniversary Edition , 2nd Edition . O'Reilly Media Company , 2019.
2.° Hofstede G., Minkov M. Cultures and Organizations: Software of the Mind. New York: McGraw-Hill. 2010.
3. Cohn M. Agile Estimating and Planning . Prentice Hall PTR, USA, 2005
4.°Berkun S. The Art of Project Management , O'Reilly Media, 2005.

Assessment and grading

Criteria for assessment of student performance, and the final score structure

The grade is assigned based on the result of self-called prect and his open defense of project work before the commission. The commission consists of teachers of departments and invited leading IT specialists. (100%)

Grading scale

Total points	National	ECTS
90–100	Excellent	A
82–89	Good	B
75–81	Good	C
64–74	Satisfactory	D
60–63	Satisfactory	E
35–59	Unsatisfactory (requires additional learning)	FX
1–34	Unsatisfactory (requires repetition of the course)	F

Norms of academic integrity and course policy

The student must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": to demonstrate discipline, good manners, kindness, honesty, and responsibility. Conflict situations should be openly discussed in academic groups with a lecturer, and if it is impossible to resolve the conflict, they should be brought to the attention of the Institute's management.
Regulatory and legal documents related to the implementation of the principles of academic integrity at NTU "KhPI" are available on the website: http://blogs.kpi.kharkov.ua/v2/nv/akademichna-dobrochesnist/

Approval

Approved by	Date	Head of the department
	August 30, 2023	Oleksii VODKA
	Date	Guarantor of the educational and professional program (1 year 4 months)
	August 30, 2023	Oleksiy LARIN

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