



National Technical University  
«Kharkiv Polytechnic Institute»

Institute of Computer Science and  
Information Technology



# Department of Software Engineering and Management Intelligent Technologies

## STUDY PROGRAMMES

- Software engineering (121)
- Computer science and intelligent systems (122)



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# OUR STUDY PROGRAMMES



**Software engineering** –  
is a field that involves  
specialization in the software  
design, development,  
construction and testing

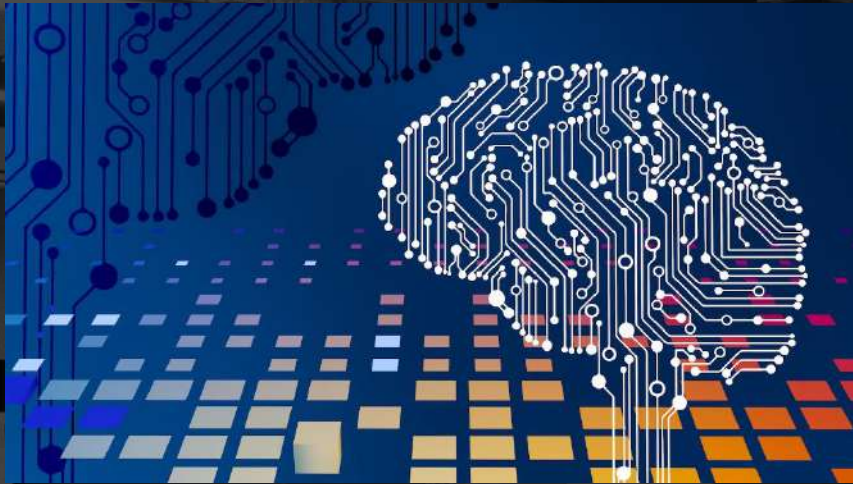


### Study programme features:

- Special education in the field of information technology in the specialty **121 «Software engineering»**
- In-depth study of computer mathematics, information technology for software development and a foreign language for IT professionals

### Students learn to:

- Develop the software
- Maintain the software
- Ensure the software quality



**Computer science and intelligent systems –**  
is a field that involves specialization in the development of software based on artificial intelligence

data analytics machine learning NoSQL  
digital transformation predictive analytics  
business analytics visualization modeling  
data lake data streams IoT executive dashboards  
prescriptive analytics hadoop

### Study programme features:

- Special education in the field of information technology in the specialty **122 «Computer science»**
- In-depth study of mathematical modeling and intelligent systems, information technology and a foreign language for IT professionals

### Students learn to:

- Develop information management technologies based on machine learning
- Develop intelligent systems for big data processing, analysis, and decision-making



# CURRICULUM STRUCTURE

Selection to the  
Innovation  
Campus

Profiled block  
and elective  
courses

Elective courses  
from the general  
catalog

1 semester

- Higher mathematics
- Physics
- Programming basics
- Introduction to the specialty
- Humanitarian disciplines

Introductory  
practice

Intensive marathon  
selection for  
participation in  
project-based  
learning and joint  
degree programme  
with the University of  
Aachen (Germany)

2 semester

- Programming basics
- Operating systems
- Algorithms and data structures
- Discrete mathematics

3-6 semesters  
Project  
practice

- Computer networks
- Object-oriented programming
- Databases
- Software architecture
- Software quality and testing

7-8 semesters

Specialized courses in  
study programmes,  
pre-graduation  
practice, writing and  
defending a thesis



# LEARNING TRACKS

1

## Research & Development

Today, it is difficult to imagine software that does not process large amounts of data and does not use artificial intelligence. Hence, this track involves an in-depth study of machine learning, intelligent systems, as well as probabilistic and knowledge representation models – a must-have for future Data Science and Machine Learning professionals.

2

## Software Development & Startup

This track is for future IT entrepreneurs who want to create their own innovative software product and make it successful in the market. Here students master internet marketing, business modeling, and business data analysis, learn how to plan projects, create software prototypes, and gain knowledge of the basics of IT entrepreneurship.

3

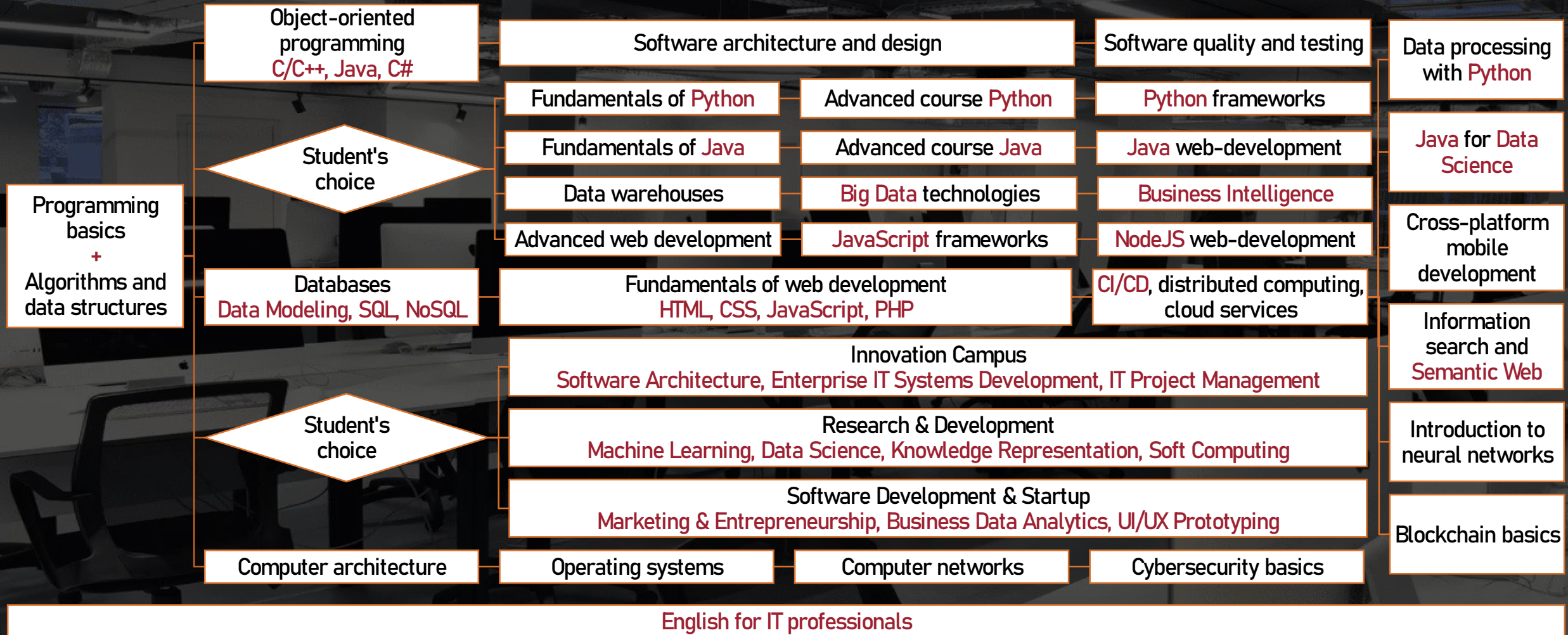
## Innovation Campus

An innovative learning track developed by a team of Ukrainian IT specialists together with NTU "KhPI" professors. The program concept is a transition from a declarative learning scheme based on knowledge acquisition to a project-based scheme aimed at acquiring practical skills in creating software products and systems.





# COURSE OF STUDY





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# KEY OPPORTUNITIES OF STUDY PROGRAMMES





# WHAT DO WE OFFER?

- 1 **Study in English**
- 2 **Dual education – combining education and work in IT**
- 3 **International student mobility**
- 4 **Project-based learning in the “Innovation Campus” laboratory**
- 5 **Joint degrees with European universities**
- 6 **Abroad internship and training programs**
- 7 **Graduates are employed by leading IT companies in Ukraine, EU, and the USA**



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**Students of our study programmes **learn English** intensively for all 4 years of study!  
In some groups, classes are taught entirely in English (even general subjects)!**

**The training is provided by the best teachers of the  
Department of Foreign Languages**



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**Innovation Campus** – is an alternative to traditional education that involves students completing individual projects independently

Basic fundamental disciplines are studied at the University, and practical disciplines – in the “Innovation Campus” laboratory!

- self-study
- P2P (peer-to-peer) study
- gamification
- project-based approach
- choosing a training track





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**Exchange programmes** at the best foreign universities in Austria, Slovakia, France, Germany and other European countries!



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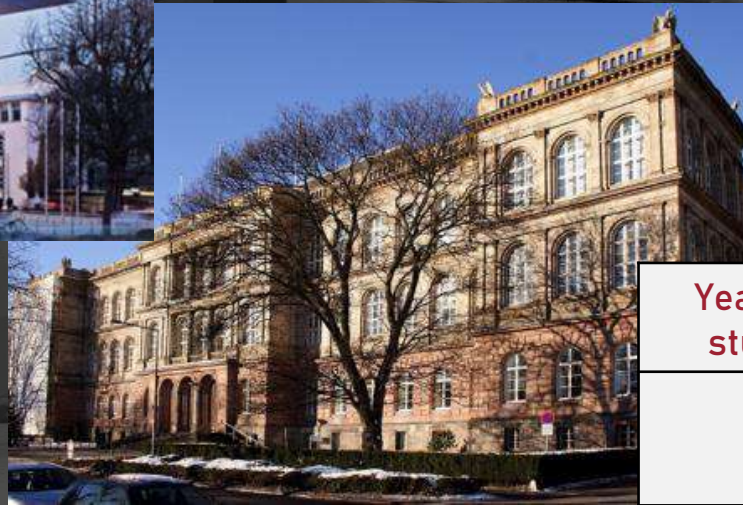


**Joint degree programmes** allow  
students to receive two diplomas  
– from NTU “KhPI” and a  
University in Austria, Slovakia,  
Sweden or Germany!





## Joint degree programme of NTU “KhPI” and RWTH Aachen University (Germany)



- **Starting from the 2<sup>nd</sup> of study, NTU “KhPI” students can be enrolled in the RWTH Aachen University in Germany**
- **It is necessary to demonstrate excellent knowledge of basic courses and German language**

| Year of study | NTU "KhPI"<br>(240 credits) | RWTH Aachen<br>(180 credits) | German<br>language level |
|---------------|-----------------------------|------------------------------|--------------------------|
| 1             | 1                           |                              | B1                       |
|               | 2                           |                              | B2                       |
| 2             | 3                           | 1                            |                          |
|               | 4                           | 2                            | C1                       |
| 3             | 5                           | 3                            |                          |
|               | 6                           | 4                            |                          |
| 4             | 7                           | 5                            |                          |
|               | 8                           | 6                            |                          |



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Training in study programmes allows  
students to participate in **foreign  
internships and trainings** in Europe  
and the **USA** with further  
employment!



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# Our graduates have great job opportunities!



Software  
Engineer/Developer  
(Frontend, Backend,  
Mobile, Fullstack  
etc.)

Software Testing  
Engineer

Software/System  
Architect

Machine Learning /  
Artificial Intelligence  
Engineer

Business  
Analyst

IT Project  
Manager

Database  
Engineer

Data Analyst  
Data Scientist

Telesens GLOBAL SOLUTIONS

GlobalLogic

niX SOLUTIONS

epam

KHARKIV IT CLUSTER

ACADEMY SMART

SoftServe

interpack

SIGMA





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**THANK YOU  
FOR YOUR ATTENTION!**