



Syllabus Course Program



Business Intelligence technologies

Specialty

121 – Software Engineering
122 – Computer Science

Educational program

Software Engineering
Computer Science and Intelligent Systems

Level of education

Bachelor's level

Semester

6

Institute

Institute of Computer Science and Information
Technology

Department

Software Engineering and Management Intelligent
Technologies (321)

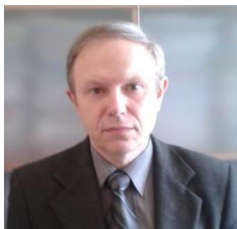
Course type

Special (professional), Elective

Language of instruction

English, Ukrainian

Lecturers and course developers



Dmytro Orlovskiy

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Ph.D., Associate Professor, Associate Professor of Software Engineering and
Management Intelligent Technologies Department

Number of publications - more than 100.

Google Scholar: <https://scholar.google.com/citations?user=bvEP0tYAAAAJ&hl>

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Scopus: <https://www2.scopus.com/authid/detail.uri?authorId=57202894400>

[More about the lecturer on the department's website](#)

General information

Summary

The task of the discipline is the acquisition by students of the knowledge and skills necessary for solving problems related to the analytical processing of data in information systems, the study of the theory and practice of the effective application of Business Intelligence (BI) methods and tools

Course objectives and goals

The formation of theoretical and practical knowledge in students, which is necessary for the effective application of Business Intelligence methods and tools in solving tasks related to the development, maintenance and quality assurance of software.

Format of classes

Lectures, laboratory classes, consultations, self-study. Final control in the form of a test.

Competencies

GC1. Ability to think abstractly, analyze and synthesize.

GC2. Ability to apply knowledge in practical situations.

GC3. Knowledge and understanding of the subject area and understanding of professional activities.

GC6. Ability to learn and master modern knowledge.

PC8. Ability to design and develop software using various programming paradigms: generalized, object-oriented, functional, logical, with appropriate models, methods and algorithms of computation, data structures and control mechanisms.

PC9. Ability to implement a multi-level computing model based on client-server architecture, including databases, knowledge and data warehouses, to perform distributed processing of large data sets on clusters of standard servers to meet the computing needs of users, including cloud services.

Learning outcomes

PLO10. To use tools for developing client-server applications, design conceptual, logical and physical models of databases, develop and optimize queries to them, create distributed databases, data warehouses and showcases, knowledge bases, including cloud services, using web programming languages.

PLO14. To apply knowledge of methodology and CASE tools for designing complex systems, methods of structural analysis of systems, object-oriented design methodology in the development and study of functional models of organizational, economic, production and technical systems.

Student workload

The total volume of the course is 150 hours (5 ECTS credits): lectures - 32 hours, laboratory classes - 32 hours, self-study - 86 hours.

Course prerequisites

Algorithmization and programming

Fundamentals of Computer Science and Artificial Intelligence

DataBases

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

Teaching and learning methods:

interactive lectures with presentations, discussions, laboratory classes, teamwork, case method, student feedback, problem-based learning.

Forms of assessment:

written individual assignments for laboratory work (CAS), assessment of knowledge in laboratory classes (CAS), express surveys (CAS), online tests (CAS), final/semester control in the form of a semester exam, according to the schedule of the educational process (FAS).

Program of the course

Topics of the lectures

Topic 1. Basic concepts of Business Intelligence

Definition of Business Intelligence. Purpose and tasks of applying Business Intelligence technologies. Business Intelligence architectural stack. General characteristics. Multi-level architecture of BI-applications.

Topic 2. Business Intelligence architectural stack. Analytical tools to support the activities of end users

The "Delivery" level, its purpose and means. The "Reporting" level, its purpose and means.

Topic 3. Business Intelligence architectural stack. Analytical tools of corporate performance management

The "Performance management" level, its purpose and means.

Topic 4. Business Intelligence architectural stack. Means of support and integration

The "Supporting applications" level, its purpose and means. The "Discovery and integration" level, its purpose and means.

Topic 5. Business Intelligence architectural stack. Analytical data processing tools

The "Analytics" level, its purpose and means.

Topic 6. Business Intelligence architectural stack. Data storage and infrastructure facilities

The "Data" level, its purpose and means. The "Infrastructure" level, its purpose and means.

Topic 7. Business Intelligence architectural stack. Means of integration and interoperability

"Vertical" components of the Business Intelligence architectural stack, their purpose and means.

Topics of the workshops

Workshops are not provided within the discipline.

Topics of the laboratory classes

Topic 1. Creation of operational data sources

Topic 2. Creation of analytical data processing tools

Topic 3. Creation of data integration tools

Topic 4. Creation of analytical tools to support the activities of end users (for example, dashboards and reports)

Topic 5. Development and application of corporate performance management tools

Self-study

Individual assignments are not provided in the curriculum.

Students are recommended with additional materials (videos, articles) for self-study and processing.

Course materials and recommended reading

Key literature

1. J. Kunigk, I. Buss, P. Wilkinson, L. George, Architecting Modern Data Platforms, O'Reilly Media, Inc., 2019, 633 p.
2. E. Sciore, Database Design and Implementation: Second Edition, Springer Nature, 2020, 468 p.
3. P. Baltzan, Business Driven Information Systems, McGraw-Hill Education, 2021, 809 p.
4. A. Simon, Data Lakes For Dummies, John Wiley & Sons, Inc., 2021, 387 p.
5. Data Management Body of Knowledge. Second Edition, Technics Publications, 2017, 778 p.

Additional literature

1. D. Petkovic, Microsoft SQL Server 2019: A Beginner's Guide. Seventh Edition, McGraw Hill Professional, 2020, 896 p.
2. Handbook of Big Data Analytics. Volume 1: Methodologies, The Institution of Engineering and Technology, 2021, 390 p.
3. Handbook of Big Data Analytics. Volume 2: Applications in ICT, security and business analytics. – The Institution of Engineering and Technology, 2021. – 419 p.
4. A. Meier, M. Kaufmann, SQL & NoSQL Databases: Models, Languages, Consistency Options and Architectures for Big Data Management, Springer, 2019, 229 p.
5. J. O. Padallan, Distributed Database Architecture, Arcler Press, 2021, 266 p.

Assessment and grading

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

Description of the final score structure, course requirements, and necessary steps to earn points, especially paying attention to self-study and individual assignments.

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

08.06.2023

Head of the department
Ihor HAMAIUN

08.06.2023

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