Załącznik nr 9
do Zarządzenia Rektora PŚk Nr 35/19
w brzmieniu ustalonym Zarządzeniem Nr 12/22

COURSE DESCRIPTION

Course code	full-time studies	
	part-time-studies	
Course name	**Zaawansowane techniki bazodanowe**	
Course name in English	**Advanced database techniques**	
Valid from academic year	**2022/23**	

PLACEMENT IN THE TEACHING PROGRAM

Field of study	**Computer Science**
Level of education	**1st degree**
Studies profile	**General**
Form and method of teaching classes	**Full-time and part-time studies**
Specialization	**All specializations**
Organizational unit responsible for the course	**Katedra Informatyki Stosowanej**
Course coordinator	**Dr hab inż. Paweł Sitek prof. PŚK**
Approved by	**Dean of the Faculty of Electrical Engineering, Automatic Control and Computer Science Roman Deniziak, KUT prof., DSc, PhD**

GENERAL CHARACTERISTIC OF THE COURSE

Course affiliation		**General education subject**
Course status		**Obligatory**
Language		**English**
Semester	full-time studies	**Semester IV**
	part-time-studies	**Semester IV**
Requirements		**Databases**
Exam (YES/NO)		**NO**
ECTS		**4**

Course form		**lecture**	**classes**	**laboratory**	**project**	**other**
Hours per semester	full-time studies	**30**		**15**	**15**	
	part-time-studies	**18**		**9**	**9**	

LEARNING RESULTS

Category	Result symbol	Learning results	References to the field of study results
Knowledge	W01	Knows and understands the basic concepts of databases, advanced database models - in particular: data warehouses.	INF_W12
	W02	Knows and understands the rules of modeling and designing advanced databases.	INF_W12
	W03	Knows and understands extensions to the standard SQL.	INF_W12
	W04	Knows and understands the principles of designing and building new generation databases: NoSQL, NewSQL, and BigData.	INF_W12
Skills	U01	Can design data warehouses, XML database, NoSQL, NewSQL, etc., multi-layer interface.	INF_U12
	U02	Can implement a database based on a project in SQL or other environment.	INF_U12
	U03	Can construct complex database queries, views and program blocks, scripts, import and export data, etc.	INF_U12
Social competence	K01	Ready to prioritize actions.	INF_K1
	K02	Ready to work in a team, solve tasks together.	INF_K2

PROGRAM CONTENT

Course form	Course content
lecture	1. Introduction to advanced databases. Analytical databases - data warehouses. ROLAP model - design, implementation, applications. Other models: MOLAP, HOLAP. 2. Extensions of the SQL language in application to the data warehouse. 3. XML databases - design, implementation, applications. 4. Models and methods of designing new generation databases: NoSQL, NewSQL, and Big data.
laboratory	1. Design of an exemplary data warehouse. 2. The use of the extended SQL language to build complex queries and obtain data from the data warehouse. 3. Designing a new generation database, e.g. NoSQL.
project	Students perform tasks in a multi-person team. Its subject is the design of the data warehouse schema and its transformation to the ROLAP model. Designing a set of analyzes for the planned data warehouse. Implementation of a data warehouse (creation of a schema, data supply, implementation of analytical queries, snapshots). Design and implementation NoSQL database.

LEARNING RESULTS VERIFICATION METHODS

Result symbol	Learning results verification methods					
	Oral exam	Written exam	Midterm	Project	Report	Others
W01			X	X		
W04			X	X		
W03			X	X		
W04			X	X		
U01				X	X	
U02				X	X	
U03				X	X	
K01				X	X	
K02				X	X	

ASSESSMENT FORMS AND CRITERIA

Course Form	Assessment Form	Assessment Criteria
lecture	pass with a grade	Obtaining at least 50% of the points in the written test
laboratory	pass with a grade	Average grade for completing tasks in class and reports.
project	pass with a grade	Obtaining at least 50% points for the developed software, its documentation and defense of the project.

STUDENT'S VOLUME OF WORK

ECTS points balance												
No	Activity Type	Student Involvement										Unit
		full-time studies					part-time-studies					
1.	Participation in classes according to the schedule	Lec	C	Lab	P	S	Lec	C	Lab	P	S	h
		30		15	15		18		9	9		
2.	Other (consultations, exams)	2		1	1		1		1	1		h
3.	**Total with the direct assist of an academic teacher**	**64**					**38**					h
4.	**Number of ECTS, that students obtains with the direct assist of an academic teacher**	**2,56**					**1,52**					ECTS
5.	**Hours of unassisted student work**	**36**					**62**					h
6.	**Number of ECTS that student obtains working unassisted**	**1,44**					**2,48**					ECTS
7.	**Practical classes volume of work**	**30**					**18**					h
8.	**Number of ECTS obtained by student at practical classes**	**1,20**					**0,72**					ECTS
9.	**Total student's volume of work expressed in hours**	**100**					**100**					h
10.	**ECTS**	**4**										ECTS

REFERENCES

1. Date C. J.: Wprowadzenie do systemów baz danych, WNT, Warszawa 2000.
2. Królikowski Z.: Hurtownie danych - logiczne i fizyczne struktury danych. Wydawnictwo Politechniki Poznańskiej, 2007, ISBN 978-83-7143-310-8
3. Agnieszka Chodkowska-Gyurics: Hurtownie danych. Teoria i praktyka, Wydawnictwo Naukowe PWN, 2019.
4. R. Wrembel, B. Bębel, Oracle - Projektowanie rozproszonych baz danych, HELION Publisher, 2003.
5. M. Jarke, M. Lenzerini, Y. Vassiliou, P. Vassiliadis, Fundamentals of Data Warehouses, Spring-er-Verlag, 2003.
6. Guy Harrison, NoSQL, NewSQL I BigDATA, Bazy danych następnej generacji, Helion, 2019.