

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Databases		Code 1010331551010330220
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 3 / 5
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: - Project/seminars: 15		No. of credits 4
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer: dr hab. Tadeusz Pankowski email: tadeusz.pankowski@put.poznan.pl tel. 607-033-007 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has the ground knowledge of mathematics, introduction do logic and algebraic structures as well as foundations of computer science, programming, operation systems and databases.
2	Skills	Student can by herself/himself acquire knowledge from the literature, databases and other sources; can also integrate the acquired knowledge, interpret it, reason, formulate conclusions and justify them.
3	Social competencies	Student knows that she/he is obliged to perform well her/his job and also knows that she/he is obliged to perform well the part of assigned to her/him part of teamwork.
Assumptions and objectives of the course: Advanced issues of database management and creation of database applications using relational and XML data. Foundations of indexing and optimization in database systems.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Ma uporządkowaną i podbudowaną teoretycznie wiedzę w zakresie baz danych oraz hurtowni danych. - [K_W08]		
Skills:		
1. Potrafi pozyskiwać informacje z literatury, baz danych i innych źródeł; potrafi integrować uzyskane informacje, dokonywać ich interpretacji, a także wyciągać wnioski oraz formułować i uzasadniać opinie. - [K_U01]		
2. Potrafi zaprojektować oraz zrealizować prostą bazę danych lub hurtownię danych oraz postęgiwać się prostymi zapytaniami. - [K_U12]		
3. Potrafi - przy formułowaniu i rozwiązywaniu informatycznych zadań inżynierskich - dostrzegać ich aspekty pozatechniczne, ekonomiczne. - [K_U21]		
Social competencies:		
1. Ma świadomość odpowiedzialności za pracę własną oraz gotowość podporządkowania się zasadom pracy w zespole i ponoszenia odpowiedzialności za wspólnie realizowane zadania. - [K_K04]		
2. Ma świadomość ważności i rozumie pozatechniczne aspekty i skutki działalności inżyniera-informatyka i związaną z tym odpowiedzialność za podejmowane decyzje. - [K_K02]		
Assessment methods of study outcomes		

<p>Lecture and classes: writing test (checking the knowledge on the foundation of databases - models, design, languages), minimal score 50,1%</p> <p>Laboratory: 3 writing tests which check the skills in designing and implementing database applications (using SQL, XML, ADO.NET, LINQ; minimal score 50,1%.</p>		
Course description		
<p>Transaction processing; ACID rules; isolation levels; locking techniques for concurrency control, two phase locking (2PL). Concurrent transactions in commercial DBMS. Recovery techniques. Distributed transactions, two phase commitment (2PC). Security and authorization in database systems. Indexes in databases: multilevel indexes and indexes based on B-trees, hash-based indexes. Advanced programming in SQL. Selected tools of database administrator. Database implementation techniques; the system catalogue; query processing and optimization. XML databases. Designing of XML databases. XML functional dependencies (XFD) and XML normal form (XNF). XML data processing languages: XPath and XQuery. Indexes for XML databases.</p> <p>Projects/seminars</p> <p>The course aims to deepen understanding of database applications, methods and tools for managing and administering databases. Considered are also methods and language for creating and processing of XML databases.</p>		
Basic bibliography:		
<p>1. H. Garcia-Molina, J. D. Ullman, J. Widom, Database System Implementation, Prentice-Hall in 2000, http://www.csd.uoc.gr/~hy460/pdf/000.pdf</p> <p>2. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, The Benjamin/Cummings, Redwood City, 1994.</p> <p>3. T. Pankowski, Podstawy baz danych, Wydawnictwo Naukowe PWN, Warszawa, 1992.</p> <p>4. NoSQL data models</p>		
Additional bibliography:		
<p>1. J. Stokłosa, T. Biłski, T. Pankowski, Bezpieczeństwo danych w systemach informatycznych, Wydawnictwo Naukowe PWN, Warszawa-Poznań, 2001.</p> <p>2. G. Malcolm, Programowanie Microsoft SQL Server 2000 z XML, MIKOM, Warszawa, 2002.</p>		
Result of average student's workload		
Activity		Time (working hours)
1. Lectures		30
2. Classes		15
3. preparation of classes and laboratories		30
4. study notes from classes and recommended literature		35
Student's workload		
Source of workload	hours	ECTS
Total workload	110	4
Contact hours	30	2
Practical activities	15	2