RTU Course "Large Databases"

12307 Sistēmu teorijas un projektēšanas katedra

General data

Code	DSP451
Course title	Large Databases
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Computer Science
Responsible instructor	Eiduks Jānis
Volume of the course: parts and credits points	1 part, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV, EN
Possibility of distance learning	Not planned
Abstract	The problems of large database (DB) design. Multibases systems. Homogeneous and heterogeneous DB systems. The data models of large DB. Optimization of DB structure. Client/server technologies. DB and transaction servers. The adminstration problems of large DB. Security policy of DB. Auditing DB use. Tuning process of DB. Recovering and backing up a DB.
Goals and objectives of the course in terms of competences and skills	1. Adoption of database systems extensions design and development technologies. 2. Design and development of spatial database extensions. 3. Design and development of temporal database extensions. 4. Design and development of multidimensional database extensions. 5. Design and development of intelligent databases extensions. 6. Design and development of XML database extensions.
Structure and tasks of independent studies	1. Spatial extension design and development. 2. Temporal database design and development. 3. Multidimensional extension design and development. 4. XML database design and development. 5. Active database design and development. 6. Deductive database design and development.
Recommended literature	1. Date C. J. An Introduction to Database systems. 8th edition. Addison-Wesley, 2003. (Ir arī tulkojums krievu valodā.) 2. Johnston T., Weis R. Managing Time in Relational Databases: How to Design, Update and Query Temporal Data. Morgan Kaufmann, 2010. 3. Silberschatz A, Korth K, Sudarshan S. Database System Concepts, 6th Edition. McGraw-Hill Science, 2010. 4. Shekhar S., Chawla S. Spatial Databases: A Tour. Prentice Hall, 2003. Pamatkoncepciju un attīstības tendenču viegli uztverams apraksts. 5. Rigaux P., Scholl M., Voisard A. Spatial Databases. With Application to GIS. Morgan Kaufmann Publishers, 2002. 6. Santos M., Amaral L.Knowledge Discovery in Spatial Databases, University of Minho, Campus de Azurem, 2000. 7. Kimball R., Ross M., Becker B. Kimball's Data Warehouse Toolkit Classics: The Data Warehouse Toolkit, 2nd Edition; The Data Warehouse Lifecycle, 2nd Edition; The Data Warehouse ETL Toolkit, 2nd edition. Wiley, 2009. 8. Golfarelli M., Rizzi S. Data Warehouse Design: Modern Principles and Methodologies. McGraw-Hill Osborne Media, 2009. 9. Inmon W.H. Building the Data Warehouse, 4th edition. Wiley, 2005. 10. Luger G.F. Artificial intelligence. Structures and strategies for Complex Problem Solving. 6th edition. Addison Wesley, 2008. 11. Bertino E., Zarri G.P. Intelligent Database Systems. Addison-Wesley, 2001.
Course prerequisites	Relational algebra, temporal algebra, objects algebra, relational and object-relational database systems, logical programming, foundation of artificial intelligence.

Course outline

Theme	Hours
Specialized database systems	2
Database systems extensions design and development technologies	4
Spatial extension design and development	4
Temporal database design and development	4
Multidimensional extension design and development	4
XML database design and development	2
Intelligent database systems design and development	2
Active database design and development	2
Deductive database design and development	4
Meta-data control	2
NoSQL databases	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
The student understands and knows how to develop a spatial databases	Final evaluation = 0.6* total evaluation of practical works + 0.4 * examination mark
The student understands and knows how to develop a temporal databases	Final evaluation = 0.6* total evaluation of practical works + 0.4 * examination mark
The student understands and knows how to develop a deductive databases	Final evaluation = 0.6* total evaluation of practical works + 0.4 * examination mark
The student understands and knows how to develop an active databases	Final evaluation = 0.6* total evaluation of practical works + 0.4 * examination mark
The student understands and knows how to develop a data warehouses	Final evaluation = 0.6* total evaluation of practical works + 0.4 * examination mark
The student understands and knows how to develop XML databases	Final evaluation = 0.6* total evaluation of practical works + 0.4 * examination mark

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	4.0	6.0	2.0	0.0	2.0		*	