COURSE DESCRIPTION CARD - SYLLABUS

Course name
XML Technology

Course

Field of study
Computing

Year/Semester
1/1

Area of study (specialization)
Data Processing Technologies

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:

Prerequisites

Knowledge of relational database systems. Knowledge of the SQL language. Basic knowledge of programming languages.

Course objective

1. Provide students with basic knowledge of XML technology in the field of: XML namespace, XPath standard, style sheets and XSL transformations, how to describe document structure using DTD and XML Schema documents, XML - XQuery document database query language, SQL/XML, and others chosen advanced topics like: XQuery, XML document databases, SVG, XSL-FO, XForms.
2. Developing students' skills in solving problems with broadly understood XML data processing, the use of XML standards in web applications, the processing of XML documents in relational databases, the use of XML document databases.

Course-related learning outcomes

Knowledge

has a structured, theoretically founded general knowledge of programming languages, paradigms and databases. (K_W4)
has a theoretically founded detailed knowledge related to selected topics in the field of computer science, such as: XML standard, XPath, XSL style sheets, XML structure description languages (DTD, XML Schema), XML document databases (XQuery, XQuery Update Facility), XML-based standards (eg. SVG, XSL-FO) (K_W5)
has knowledge of development trends and the most important new achievements in computer science and in selected related scientific disciplines. (K_W6)
knows the basic methods, techniques and tools used to solve complex engineering tasks in a selected area of computer science. (K_W8)

Skills

can - when formulating and solving engineering tasks - integrate knowledge from various areas of computer science (and, if necessary, also knowledge from other scientific disciplines) (K_U10)
can define the directions of further learning and implement the self-education process, (K_U5)
is able to obtain information from literature, databases and other sources (in the mother tongue and in English), integrate them, interpret and critically evaluate them, draw conclusions and formulate and exhaustively justify opinions, (K_U1)
is able to formulate and test hypotheses related to engineering problems and simple research problems (K_U12)
can assess the usefulness and the possibility of using new achievements (methods and tools) and new IT products (K_U13)

Social competences

understands that knowledge and skills very quickly become obsolete in computer science (K_K1)
knows examples and understands the causes of malfunctioning information systems that have led to serious financial and social losses, or to a serious loss of health and even life (K_K4)

Methods for verifying learning outcomes and assessment criteria

Learning outcomespresented above are verified as follows:

Formative assessment:
a) in the field of lectures:
- on the basis of answers to questions about the material discussed in previous lectures,
b) in the field of laboratories / exercises:
- based on the assessment of the current progress in the implementation of tasks,
Summative assessment:
a) in the field of lectures, verification of the assumed learning outcomes is carried out by:
- assessment of the knowledge and skills demonstrated in the problem-based written test (the student may use any teaching materials).
The lecture test usually consists of 5-8 questions covering the following topics: transformation with style sheets, the use of XML schemas to describe the structure of XML documents, the use of XQuery

language, a question related to other issues discussed in the lecture.
For a satisfactory grade, more than 50% of the possible points should be obtained. Each subsequent 10% of possible points increases the rating by half a point.
b) in the field of laboratories / exercises, verification of the assumed learning outcomes is carried out by:
- assessment of the acquired knowledge and skills of the student with the implementation of laboratory classes by means of test tests (entry test),
- assessment of knowledge and skills related to the implementation of project tasks,
- assessment of knowledge and skills on the basis of a final written exam,
Obtaining additional points for activity during classes, especially for:
- active participation in classes consisting in solving tasks,
- the effectiveness of applying the acquired knowledge while solving a given problem,
- remarks related to the improvement of teaching materials,
- identifying students' perceptual difficulties enabling ongoing improvement of the teaching process.
The distribution of points obtained as part of the final written pass for classes and other forms of verification of the assumed learning outcomes is 50% / 50%.
For a satisfactory grade, over 50% of possible points should be obtained. Each subsequent 10% of possible points increases the rating by half a point.

Programme content

Wykład:
The lecture program covers the following topics:
1. Use of XML namespaces. Overview of the XPath standard and how to use it
2. XSL Standard. XSL transformations. Structure, definition and use of XSL stylesheets
3. Ways of defining XML document structures. Structure, definition and use of XML schemas - the basics
4. The structure, definition and use of XML schemas - the use of namespaces, integration of XML schemas defining the structure of XML documents based on multiple namespaces.
5. XQuery language as a query language for XML document databases. XQuery clauses, defining and using your own XQuery functions.
6. XML and relational databases - standard SQL / XML. Overview of the scope of the SQL / XML standard illustrated with examples of real implementations
7. Selected topic: XQuery Update Facility, SVG, XSL-FO, XForms.
8. Final test.Laboratoria:
Laboratory classes are conducted in the form of fifteen 2-hour exercises, held in the laboratory. The main task of the exercises is the practical use of the knowledge gained during the lecture. The laboratory program covers the following topics:
1. Standard XPath, structure of XPath expressions, XPath functions, use of XPath in selected XML technologies.
2. XSL Standard. XSL transformations. Structure, definition and use of XSL stylesheets
3. Ways of defining XML document structures. Structure, definition and use of XML schemas - the basics
4. The structure, definition and use of XML schemas - the use of namespaces, integration of XML schemas defining the structure of XML documents based on multiple namespaces.
5. XQuery language as a query language for XML document databases. XQuery clauses. Building XQuery

commands. Using XQuery to process XML documents in an XML document database. Defining and using your own XQuery functions.
6. XML and relational databases - standard SQL / XML. Using the SQL / XML standard to generate XML documents based on the relational database content.
7. Selected topic: XQuery Update Facility, SVG, XSL-FO, XForms.
8. Final test.

Teaching methods

1. Lecture: multimedia presentation, presentation illustrated with examples given on the board, discussion, multimedia show, demonstration
2. Laboratory exercises: practical exercises, discussion, team work, workshops, integration games, case studies, demonstration

Bibliography

Basic

1. XML na poważnie, Przemysław Kazienko, Krzysztof Gwiazda, Wydawnictwo: Helion, 2002
2. Beginning XML, 4th Edition, David Hunter, Jeff Rafter, Joe Fawcett, Eric van der Vlist, Danny Ayers, Wydawnictwo: Wrox, 2007
3. XML dla każdego (org: Teach Yourself XML in 21 Days), Simon North, Paul Hermans; tł. Tomasz Żmijewski, Wydawnictwo: Helion, 2000
4. Wszystko o XML Schema (org: Definitive XML Schema), Priscilla Walmsley; tł. Szymon Zioło, Wydawnictwo: Wydawnictwa Naukowo-Techniczne, 2008
5. XSLT : vademecum profesjonalisty (org: Inside XSLT), Steven Holzner; tł. Tomasz Żmijewski, Robert Riger, Wydawnictwo: Helion, 2002
6. Namespaces in XML 1.0 - http://www.w3.org/TR/xml-names/, 2006
7. XML Schema - http://www.w3.org/XML/Schema, 2004
8. SQL/XML is Making Good Progress, A. Eisenberg, J.Melton, ACM SIGMOD Record Vol. 31, No. 2., 2002
9. Database Languages - SQL - Part 14: XML-Related Specifications (SQL/XML), 2006
10. XQuery - http://www.w3.org/XML/Query/, 2007
11. XQuery Update Extension - http://www.w3.org/TR/xquery-update-10-requirements/, 2007

Additional

1. Data on the Web, S. Abiteboul, Serge Abiteboul, Peter Buneman, Dan Suciu, Morgan Kaufmann Pub, 1999
2. XML Data Management, A. B. Chaudhri, A. Rashid, R. Zicari, Addison-Wesley, 2003
3. XQuery, Priscilla Walmsley, O'Reilly, 2007
4. XSLT, Doug Tidwell, O'Reilly, 2008

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3
Classes requiring direct contact with the teacher	30	1.5
Student's own work (literature studies, preparation for laboratory classes, preparation for tests, project preparation)	45	1.5