

## FIȘA DISCIPLINEI

### 1. Information on the study programme / Date despre program

1.1. Institution / Instituția de învățământ superior	Universitatea de Vest din Timișoara
1.2. Faculty / Facultatea	Matematică și Informatică
1.3. Department / Departamentul	Computer Science (Informatică)
1.4. Study program field	Computer Science (Informatică)
1.5. Study cycle/ Ciclul de studii	MSc / Master
1.6 Study programme / Programul de studii / Calificarea	Artificial Intelligence and Distributed Computing

### 2. Information on the course / Date despre disciplină

2.1 Title of the course / Denumirea disciplinei		Distributed methods and technologies based on XML					
2.2 Teacher in charge of the course / Titularul activităților de curs		Teodor-Florin FORTIȘ					
2.3 Teacher in charge of the seminar / Titularul activităților de seminar		Teodor-Florin FORTIȘ					
2.4 Study year / Anul de studiu	2	2.5. Semester / Semestrul	1	2.6. Examination type / Tipul de evaluare	E	2.7. Course type / Regimul disciplinei	DO

### 3. Estimated study time (number of hours per semester) /Timpul total estimat (ore pe semestru al activităților didactice)

3.1 Attendance hours per week / Număr de ore pe săptămână	3	out of which / din care: 3.2 lecture / curs	2	3.3 seminar/laborator	1
3.4 Attendance hours per semester / Total ore din planul de învățământ	42	out of which / din care: 3.5 lecture / curs	28	3.6 seminar/laborator	14
Distribution of the allocated amount of time / Distribuția fondului de timp:					ore
Individual study / Studiul după manual, suport de curs, bibliografie și notițe					28
Supplementary documentation at library or using electronic repositories / Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate / pe teren					28
Preparing for laboratories, homework, reports etc. / Pregătire seminare / laboratoare, teme, referate, portofolii și eseuri					28
Tutoring / Tutoriat					7
Exams / Examinări					7
Other activities / Alte activități					7
3.7 Total number of hours of individual study / Total ore studiu individual	105				

3.8 Total number of hours per semester / Total ore pe semestru	147
3.9 Number of credits (ECTS) / Numărul de credite	5

#### 4. Preconditions / Precondiții (acolo unde este cazul)

4.1 curriculum / de curriculum	Distributed Systems, Workflow technologies, Parallel computing
4.2 skills / de competențe	<p><i>C1. Programarea în limbaje de nivel înalt</i>  <i>C2. Dezvoltarea și întreținerea aplicațiilor informatice.</i>  <i>C4. Utilizarea bazelor teoretice ale informaticii.</i>  <i>C5. Utilizarea și administrarea sistemelor de calcul, bazelor de date și rețelelor de calculatoare</i></p> <p>C1. Programming in high level languages  C2. Development and maintenance of computer applications.  C4. Use of theoretical basis of computer science.  C5. Use and management of computing systems, databases, computer networks.</p>

#### 5. Conditions / Condiții (acolo unde este cazul)

5.1 for the lecture / de desfășurare a cursului	<p><i>Sală de curs, dotată corespunzător: tablă, laptop/proiector, software adecvat săli de curs virtuale, folosind mijloace de comunicare specifice e-uvt (Classroom, Meet, Teams)</i>  Lecture room, at least with: laptop/head projector, corresponding software; virtual lecture rooms, using e-uvt specific communication means (<i>Classroom, Meet, Teams</i>)</p>
5.2 for the seminar, laboratory / de desfășurare a seminarului / laboratorului	<p><i>Sală de curs, dotată corespunzător: tablă, laptop/proiector, software adecvat săli de curs virtuale, folosind mijloace de comunicare specifice e-uvt (Classroom, Meet, Teams)</i>  Lecture room, at least with: laptop/head projector, corresponding software; virtual lecture rooms, using e-uvt specific communication means (<i>Classroom, Meet, Teams</i>)</p>

#### 6. Objectives of the course / Obiectivele disciplinei - rezultate așteptate ale învățării la formarea cărora contribuie parcurgerea și promovarea disciplinei

Knowledge / Cunoștințe	<p><i>Ob.1. Să înțeleagă și utilizeze noțiunile de bază XML; 2. Să identifice mecanisme de construcție a aplicațiilor bazate pe XML; 3. Să identifice mecanisme de comunicare bazate pe XML; 4. Să înțeleagă noțiunile legate de comunicare bazată pe XML;</i>  <i>Ob.5. Să identifice tehnologiile XML; 6. Să identifice mecanisme și șabloane specifice; 7. Să stabilească oportunitatea utilizării mecanismelor și șabloanelor specifice.</i>  <i>Ob. 8. Să argumenteze necesitatea utilizării mecanismelor de specifice; 9. Să argumenteze importanța utilizării XML în aplicații concurente și distribuite.</i></p> <p>Ob.1. To understand and use basic XML notions; 2. To identify building mechanisms for XML-based applications; 3. To identify XML-based communication means; 4. To understand the notions related with XML-based communication  Ob.5. To identify XML technologies; 6. To identify specific mechanisms and technologies; 7. To establish the opportunity of using specific mechanisms and technologies;  Ob.8 To argue the necessity of using specific mechanisms; to argue the relevance of using XML in the context of distributed applications</p>
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Abilities / Abilități	<p><i>Utilizarea unor metode și tehnici eficiente de învățare, informare, cercetare și dezvoltare a capacităților de valorificare a cunoștințelor, de adaptare la cerințele unei societăți dinamice și de comunicare în limba română și într-o limbă de circulație internațională</i></p> <p>The use of effective methods and techniques of learning, information, research and development of the capacity of knowledge exploitation, of adapting to the requirements of a dynamical society, and communication in Romanian and in a foreign language.</p>
Responsability and autonomy / Responsabilitate și autonomie	<p><i>Capacitatea de a înțelege și utiliza noțiunile de bază legate de utilizarea tehnologiilor XML pentru realizarea aplicațiilor distribuite</i></p> <p><i>Capacitatea de a rezolva probleme în contextul aplicațiilor distribuite și concurente bazate pe XML</i></p> <p>The capacity to understand and use of basic knowledge related with XML technologies, for the development of distributed applications.</p> <p>The capacity to solve problems in the context of XML-based distributed and concurrent application.</p>

## 7. Content / Conținuturi

8.1 Lecture / Curs	Teaching strategies / Metode de predare	Remarks, details / Observații
1. Introduction. XML structures, XML technologies, XML-based web services. Basic concepts. (Ob.1,2)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
2. The XML language. Basics of the XML language. (Ob.1,2)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
3. XSD. Technologies for data type specification. Simple data types. Complex data types. (Ob.1,2,5)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
4. Remote procedure calls. XML-RPC. Use of XML-RPC for the development of client-server web applications. (Ob.1,2,3,6)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
5. Processing instructions. XML expath. XPath and XQuery (Ob.1,2,3,6)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
6. SOAP and WSDL. SOAP messages, SOAP requests. (Ob.1,2,3,5)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
7. Web Services Description Language. SOAP and WSDL usage. Describing and using web services (Ob.1,2,4,5)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
8. Synchronous and asynchronous web services. Endpoints. (Ob.1,2,4,5)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvvt.ro facilities including online learning
9. XSLT transformations. Sablon and Xalan libraries.	Interactive exposure, problem solving, heuristic conversation,	1 week, 2 hours

Using XSLT for XML transformations. (Ob.1,2,3,5)	documentation on the web, exemplification.	All materials are available via the e-uvv.ro facilities including online learning
10. SOA architecture. SOA concepts. SOA components. (Ob.1,2,4,5)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvv.ro facilities including online learning
11. Developing graphical interfaces: XForms, XML Pipelines, page flows. Integration of graphical interface (Ob.1,2,3,6)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvv.ro facilities including online learning
12. Languages for business processes: BPEL. Specific WSDL extensions. (Ob.1,2,3,4,5,6)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvv.ro facilities including online learning
13. Description of BPEL processes. BPEL activities. Process execution. Installing and configuring services. (Ob.1,2,3,4,5,6)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvv.ro facilities including online learning
14. Testing WEB Services: BPEL UNIT, SOAP UI, other specific tools. (Ob.1,2,5,6)	Interactive exposure, problem solving, heuristic conversation, documentation on the web, exemplification.	1 week, 2 hours All materials are available via the e-uvv.ro facilities including online learning
<b>Bibliografie :</b> [1] <a href="http://www.openwddx.org">http://www.openwddx.org</a> , The OpenWDDX white paper [2] Adam Freeman, Allen Jones, Microsoft .NET XML Web Services Step by Step, Microsoft Press; 1 edition, 2002, ISBN: 0735617201 [3] Brian Benz, John Durant, XML Programming Bible (2nd edition), John Wiley & Sons, 2003, ISBN: 0764538292 [4] Scott Short, Building XML Web Services for the Microsoft .NET Platform, Microsoft Press, 2002, ISBN: 0735614067 [5] Michael C. Daconta, Leo J. Obrst, Kevin T. Smith, The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management, Wiley, 2003, ISBN: 0471432571 [6] Lucinda Dykes, Ed Tittel, Chelsea Valentine, XML Schemas, Sybex Inc, 2002, ISBN: 0782140459 [7] R. Allen Wyke, Sultan Rehman, Brad Leupen, XML Programming, Microsoft Press, 2002, ISBN: 0735611858 [8] Eric Newcomer, Understanding Web Services: XML, WSDL, SOAP, and UDDI, Addison-Wesley Professional, 2002, ISBN: 0201750813 [9] James Snell, Doug Tidwell, Pavel Kulchenko, Programming Web Services with SOAP, O'Reilly, 2001, ISBN: 0596000952 [10] Harvey M. Deitel, Paul J. Deitel, B. DuWaldt, L. K. Trees, Web Services: A Technical Introduction, Prentice Hall PTR, 2002, ISBN: 0130461350		
8.2 Seminary, lab / Seminar, laborator	Teaching strategies /Metode de predare	Remarks, details / Observații
The XML language. General information. XML libraries (Ob.1,2,8)	Excercise, conversation and debate, modelling, project, working in organized groups.	2 week, 2 hours All materials are available via the e-uvv.ro facilities including online learning
Developing XML language. SAX and DOM. Parsing XML files (Ob.1,2,8)	Excercise, conversation and debate, modelling, project, working in organized groups.	2 week, 2 hours All materials are available via the e-uvv.ro facilities including online learning

Developing XML files. XML validation. DTD and XSD validation. (Ob.1,2,8)	Excercise, conversation and debate, modelling, project, working in organized groups.	2 week, 2 hours All materials are available via the e-uvt.ro facilities including online learning
Querying XML files: pointing technologies. Xpath and XQuery (Ob.1,2,8,9)	Excercise, conversation and debate, modelling, project, working in organized groups.	2 week, 2 hours All materials are available via the e-uvt.ro facilities including online learning
Transforming XML files: XSLT and XSL-FO (Ob.1,2,8,9)	Excercise, conversation and debate, modelling, project, working in organized groups.	2 week, 2 hours All materials are available via the e-uvt.ro facilities including online learning
Developing intelligent interfaces: XHTML and XForms (Ob.1,2,5,6)	Excercise, conversation and debate, modelling, project, working in organized groups.	2 week, 2 hours All materials are available via the e-uvt.ro facilities including online learning
Case study: integration of XML technologies (Ob.5,6,7,8)	Excercise, conversation and debate, modelling, project, working in organized groups.	2 week, 2 hours All materials are available via the e-uvt.ro facilities including online learning
<p><b>Bibliografie :</b></p> <p>[1] <a href="http://www.openwddx.org">http://www.openwddx.org</a>, The OpenWDDX white paper</p> <p>[2] Adam Freeman, Allen Jones, Microsoft .NET XML Web Services Step by Step, Microsoft Press; 1 edition, 2002, ISBN: 0735617201</p> <p>[3] Brian Benz, John Durant, XML Programming Bible (2nd edition), John Wiley &amp; Sons, 2003, ISBN: 0764538292</p> <p>[4] Scott Short, Building XML Web Services for the Microsoft .NET Platform, Microsoft Press, 2002, ISBN: 0735614067</p> <p>[5] Michael C. Daconta, Leo J. Obrst, Kevin T. Smith, The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management, Wiley, 2003, ISBN: 0471432571</p> <p>[6] Lucinda Dykes, Ed Tittel, Chelsea Valentine, XML Schemas, Sybex Inc, 2002, ISBN: 0782140459</p> <p>[7] R. Allen Wyke, Sultan Rehman, Brad Leupen, XML Programming, Microsoft Press, 2002, ISBN: 0735611858</p> <p>[8] Eric Newcomer, Understanding Web Services: XML, WSDL, SOAP, and UDDI, Addison-Wesley Professional, 2002, ISBN: 0201750813</p> <p>[9] James Snell, Doug Tidwell, Pavel Kulchenko, Programming Web Services with SOAP, O'Reilly, 2001, ISBN: 0596000952</p> <p>[10] Harvey M. Deitel, Paul J. Deitel, B. DuWaldt, L. K. Trees, Web Services: A Technical Introduction, Prentice Hall PTR, 2002, ISBN: 0130461350</p>		

### **8. Correlations between the content of the course and the requirements of the IT field / Coroborarea conținuturilor disciplinei cu așteptările reprezentanților comunității epistemice, asociațiilor profesionale și angajatori reprezentativi din domeniul aferent programului**

The content of the course corresponds with curricula of other universities in Romania or the European Union. The contents of practical work (labs) meet the requirements of the local labor market.

## 9. Evaluare

Activity / Tip de activitate	9.1 Evaluation criteria / Criterii de evaluare	9.2 Evaluation methods / Metode de evaluare	9.3 Weight in the averaged mark / Pondere din nota finală
9.4. Lecture /Curs	<p>The evaluation is based on the following items:</p> <ul style="list-style-type: none"> <li>• General knowledge, use of XML applications, use of XML supporting technologies (like XSD, XPath, WSDL, etc.)</li> <li>• Detailed knowledge, use of XML technologies for the development of applications of medium complexity, in an heterogeneous environment.</li> </ul> <p>Advanced knowledge, applying acquired mechanisms for complex problems, eventually by using different communication means.</p> <p>Homeworks and project activities cover specific parts, as they were exposed during the semester, and their solution is based on laboratory activities.</p>	<p>Written examination, during weeks #8-9; active participation in course activities individual or group project.</p> <p>Individual or group project.</p>	<p>20</p> <p>40</p>
9.5. Seminar/laborator	<p>The evaluation is based on the following items:</p> <ul style="list-style-type: none"> <li>• General knowledge, use of XML applications, use of XML supporting technologies (like XSD, XPath, WSDL, etc.)</li> <li>• Detailed knowledge, use of XML technologies for the development of applications of medium complexity, in an heterogeneous environment.</li> </ul> <p>- Advanced knowledge, applying acquired mechanisms for complex problems, eventually by using different communication means.</p>	<p>Homework evaluation, additional activities; homework evaluation, active participation in laboratory activities</p>	<p>40</p>
9.6 Minimal knowledge for passing /Standard minim de performanță			
<p>Written exam:</p> <ul style="list-style-type: none"> <li>• For the minimum grade the student is expected to show an average level of understanding (at least 60%) for the general knowledge, and a minimal level of understanding for the detailed knowledge, as presented before, eventually via the description of an average proof concept project.</li> <li>• For the maximum grade (10) the student is required to show a superior level of understanding (at least 80%) for the advanced knowledge.</li> </ul> <p>Practical and laboratory activities :</p> <ul style="list-style-type: none"> <li>• For the minimum grade the student is expected to show an average level of understanding (at least 60%) for the general knowledge, and a minimal level of understanding for the detailed knowledge, as presented before, eventually via the description of an average proof concept project.</li> <li>• For the maximum grade (10) the student is required to show a superior level of understanding (at least 80%) for the advanced knowledge.</li> </ul> <p>The final grade is based on an average of the two grades (written and practical exams). The minimal grade can be achieved only if an average of at least 50% of the maximum result was achieved and at least 45% of the maximum result for each of the two components was realized.</p>			

All the results can be considered for any future examination during the same university year, provided they represent at least 50% of the maximum grade for the corresponding component.

Examinare scrisă:

- Pentru nota 5 este necesară obținerea unui nivel superior (minim 60%) de înțelegere a cunoștințelor generale, precum și a unui nivel minim de înțelegere a cunoștințelor de detaliu prezentate anterior, prin descrierea scheletului unei aplicații de dificultate medie.
- Pentru nota 10 este necesară dovedirea unui nivel superior (minim 80%) pentru cunoștințele avansate, precizate anterior.

Probe practice și activitate de laborator:

- Pentru nota 5 este necesară obținerea unui nivel superior (minim 60%) de utilizare pentru cunoștințele generale, precum și a unui nivel minim de utilizare a cunoștințelor de detaliu prezentate anterior, prin participarea la realizarea unei aplicații de dificultate medie.

Pentru nota 10 este necesară dovedirea unui nivel superior (minim 80%) pentru cunoștințele avansate, precizate anterior.

Nota finală se calculează ca medie ponderată a notelor acordate pentru cele două componente.

Examenul se consideră promovat dacă este obținută o medie de cel puțin 50% din rezultatul maxim și cel puțin 45% pentru fiecare dintre cele două componente.

La fiecare dintre sesiunile de restanțe/măriri se consideră promovate componentele pentru care a fost obținut un rezultat de cel puțin 50% din rezultatul maxim al componentei respective (reprezentând nota 5), cu excepția cazului în care studentul dorește să susțină și aceste componente.

Data completării

14.09.2021

Titular de disciplină  
Conf.dr. Teodor-Florin FORTIȘ

Data avizării în departament

Director de departament