COURSE DESCRIPTION

1. Information about the programme

1.1 Institution of higher education	**„Alexandru Ioan Cuza” University of Iasi**
1.2 Faculty	**Faculty of Economics and Business Administration**
1.3 Department	**Department of Accounting, Business Information Systems and Statistics**
1.4 Field of study	**Business Information Systems**
1.5 Level	**Master**
1.6 Study programme/ Qualification	**Software Development and Business Information Systems (SDBIS)**

2. Information about the course

2.1 Course name	**Data Warehouses (DWH/DW)**						
2.2 Course coordinator 2.3 Seminar coordinator	**researcher Daniel HOMOCIANU, Ph.D.**						
2.4 Year of study	I	2.5 Semester	II	2.6 Type of assessment	project modules, theoretical presentations and exam	2.7 Discipline status	**E**

** C – Compulsory / E - Elective*

3. Total estimated time (hours alloted to didactic activity per semester)

3.1 Total number of hours per week	3	of which: 3.2 lecture	1	3.3 seminar/lab	2
3.4 Total number of hours in the curriculum	42	of which: 3.5 lecture	14	3.6 seminar/lab	28

Time distribution	hours
Study of the handbook, coursebook, bibliography and notes	42
Additional research in the library, online and on the field	22
Preparation of seminars/labs, homeworks and projects	42
Tutorials	15
Assessment	17
Other activities.....	-

3.7 Total number of self-study hours	138
3.9 Total number of hours per semester	180
3. 10 Number of credits	6

4. Prerequisites (if applicable)

4.1 curriculum-based	• Databases (or similar)
4.2 competence-based	• Not applicable

5. Conditions (if applicable)

5.1. for lectures	• Lecture rooms shall be provided with video projector • Students will attend lectures. Cell phones must be turned off.

5.2. for seminars/labs	• IT services of the faculty will provide a virtual machine (tinyurl.com/z47h6y2) containing Microsoft (MS) SQL Server, Visual Studio (VS) & Office installed (DreamSpark license); • Students are invited to bring and use their own laptops; MS SQL Server, VS and Office could be installed on each laptop, but they can also use them inside the virtual machine, so the minimum requirement is MS Virtual PC / Hyper-V / Oracle Virtual Box • Labs will have enough computers for students not owning a laptop • Lab computers will offer at least the virtual machine with all applications installed

6. Assimilated specific competences

Professional competences	• Familiarizing with multidimensional data models and gaining knowledge on implementation and exploatation metodologies (1 credit) • Knowledge of main software products as datawarehouses and OLAP (1 credit) • Gaining abilities of design and implementation of datawarehouses (1 credit) • Gaining skills of datawarehouse maintenance (1 credits)
Transversal competences	• Ability to communicate and collaborate in teams of different professionals (1 credit) • Continuous improvement of specific skills and knowledge towards approaching information systems, development of new software technologies and management of information systems (1 credit)

7. Discipline objectives (provided by the assimilated specific competences grid)

7.1 The general objective of the discipline	• To provide the knowledge of Data Warehouse (DWH) technologies in order to efficiently implement them in organizations
7.2 Specific objectives	• Basic knowldge of multidimensional data models and implementation methodologies • Knowledge of main DWH products • Ability to design and implement a DWH • Basic Knowledge of exploiting DWH technologies in organizations

8. Content

8. 1 **LECTURE**	Teaching methods	Observations
Introduction to the DWH discipline including the presentation of requirements and planning those at least 10 specific presentations (20%) of the master students teams about: 1.retail sales, 2.inventory, 3.procurement, 4.order management, 5.accounting, 6.CRM, 7.HRM, 8.financial services, 9.telecommunications, 10.transportation, 11.education, 12.healthcare, 13.e-commerce, 14.insurance (20% in the final grade. Details: tinyurl.com/jogo5uy (Kimball&Ross,2013)	PPT presentations, explanations, conversations and questioning	1 lecture (2 hours)
Brief history (Inmon &Linstedt,2015). **Data Architecture** (Kimball&Ross,2016) + at least 2 specific presentations		1 lecture (2 hours)
Dimensional Modeling (Kimball&Ross,2016) + at least 2 specific presentations		1 lecture (2 hours)
Technical Architecture Considerations (Kimball&Ross,2016) + at least 2 specific presentations		1 lecture (2 hours)

Extract Transform Load and Data Quality (Kimball&Ross,2016) + at least 2 specific presentations		1 lecture (2 hours)
DWH Lifecycle (Kimball&Ross,2013) + at least 2 specific presentations		1 lecture (2 hours)
Trends in the evolution of DWH: **Extended RDBMS Architecture** (Kimball&Ross,2013). **Pushing into the Future** (Reeves,2009). **DWH 1.0 vs. 2.0** (Krishnan, 2013)+ at least 2 specific presentations		1 lecture (2 hours)
Bibliography: -Airinei, D., Depozite de date, Polirom, Iaşi, 2002, portal.feaa.uaic.ro/Master/sia/Pages/default.aspx) -Inmon,W.H.,Linstedt, D., Data Architecture:A primer for the data scientist, MK, MA, 2015 (tinyurl.com/h7dcq66) -Kimball, R., Ross, M., The Data Warehouse Toolkit Third Edition. The Definitive Guide to Dimensional Modeling, John Wiley & Sons, New York, 2013 (tinyurl.com/jogo5uy) -Kimball, R., Ross, M., The Kimball Group Reader. Relentlessly Practical Tools for Data Warehousing and Business Intelligence – Remastered Collection, Second Edition, Wiley, New York, 2016 (tinyurl.com/johox4v) -Krishnan, K, Data Warehousing in The Age of Big Data, Morgan Kaufmann (MK), MA, 2013 (tinyurl.com/zrjo75j) -Reeves, L.L., A Manager's Guide to Data Warehousing, Wiley, New York, 2009 (tinyurl.com/htsslk8)		
8. 2 **SEMINAR / LAB**	Teaching methods	Observations
Creating a DWH project comparatively by using Microsoft SQL Server Analysis Services (two examples starting from different types of databases) and Excel Power Pivot add-in (plus individual homework for next week: come with your own examples: 3 dimensions, 3 hierarchies and 3 measures for both technologies)	demonstration, tutorials, questioning	3 labs (3rd in 3rd week for verifying the specific home work – 6.66% in final grade)
Creating SQL Server MDX (MultiDimensional eXtension) queries to get data from a DWH cube (individual homework for next week: come with your own examples - at least 6 queries)	demonstration, query execution, questioning	2 labs (2nd in 5th week for verifying the specific home work – 6.66% in final grade)
Using ADOMD (ActiveX Data Object MultiDimensional) objects to connect to a DWH cube in Microsoft Visual Studio .NET 2013 (individual homework for next week: come with your own examples - at least 1 form including charts and interactive controls for customizing at least one generic support MDX query)	demonstration, code execution, questioning	2 labs (2nd in 7th week for verifying the specific home work – 6.66% in final grade)
Creating Data Mining (DM) models starting from DWH cubes / relational data sources / tables by using comparatively Microsoft SQL Server Analysis Services and Microsoft Excel Data Mining add-in (individual homework for next week: come with your own examples - at least 2 models based on different algorithms for both)	demonstration, tutorials, questioning	2 labs (2nd in 9th week for verifying the specific home work – 6.66% in final grade)
Creating SQL Server DMX (DataMining eXtension) queries in relation to the Data Mining models previously defined (individual homework for next week: come with your own examples - at least 6 queries,3/model)	demonstration, query execution, questioning	2 labs (2nd in 11th week for verifying the specific home work – 6.66% in final grade)
Using ADOMD (ActiveX Data Object MultiDimensional) objects to connect to Data Mining models in Microsoft Visual Studio .NET 2013 (individual homework for next week: come with your own examples - at least 1 form including charts and interactive controls for customizing at least one generic support DMX query)	demonstration, code execution, questioning	2 labs (2nd in 13th week for verifying the specific home work – 6.66% in final grade)
Data Cubes in on-line environments (e.g. nesstar-demo.nsd.uib.no/webview/).Computing practical evaluation results.	tutorials, questioning	1 lab (6 * 6.66% = 40%)

Bibliography: -Airinei, D., Dopspinescu, O., Huiban, A., Aplicatii practice cu sisteme OLAP si Depozite de date, Editura Sedcom Libris, Iaşi, 2008
-Homocianu, D., Sistemele de asistare a deciziilor in contextual societatii cunoasterii, Editura UAIC, Iasi, 2009 (ssrn.com/abstract=2384380)
-Sarka, D., et. al., Implementing a Data Warehouse with Microsoft SQL Server 2012. Training Kit, O'Reilly Media, Sebastopol, 2012 (tinyurl.com/jk6lclk)
-Sheldon, B., et. al., Professional Visual Basic 2012 and .NET 4.5 Programming, John Wiley & Sons, Indianapolis, 2013 (tinyurl.com/hrb6j9u)
http://www.nesstar.com/export/sites/default/doc/nesstar_cubes.pdf

9. Corroboration of the discipline content with the expectations of epistemic community representatives, professional associations as well as of representative employers in the programme related field.

The content of this discipline has been decided upon by taking into account both the curricula of some prestigious Western Universities and the demands of the economic environment provided by potential employers, either in the public or in the private IT companies.

10. Assessment

Type of activity	10.1 Assessment criteria	10.2 Assessment methods	10.3 Share of final grade
Developing support components for a DWH application prototype	Real-world application, complexity, validity and originality	Six face-to-face lab presentations of the homework about: the design of DWHcubes & DM models implemented, the support MDX & DMX queries and the code execution behind .NET forms in weeks No.: 3, 5, 7, 9, 11 and 13.	40% (6 * 6.66%)
Theoretical presentations during lecture hours (see those 14 themes on domains at section 8.1, pp.2)	Format, consistent pro-or-cons arguments, originality of comments and conclusions	Theoretical presentation and responses to questions	20%
Theoretical exam	Knowledge about DWH theory, real-world scenarios and personal implementations	Final theoretical test with at least three open questions	40%

10.6 Minimum performance standard

- Design and implement a DWH cube, a DM model, two interfaces to programmatically connect to and query them by using MDX and DMX queries, alternative examples (user mode) with Microsoft Excel add-ins;
- Each master student must create, present and answer questions for a part of those at least 10 specific presentations (14 themes on domains - section 8.1, pp.2) during lecture hours;
- The average grade for all those six face-to-face lab presentations (section 8.2, pp.3) of the homework is grater than or equal to 5;
- The grade for the final theoretical test must be greater than or equal to 5.

Date of completion
09/15/2016

Course and seminar coordinator
researcher Daniel HOMOCIANU, Ph.D

Date of approval within the department
09/19/2016

Head of CIES Department
professor Florin DUMITRIU, Ph.D.