



Course Specification

Course Name: Data Warehousing

Course Code: IS422

I. Basic Course Information

Major or minor element of program: Major

Department offering the course: Information Systems Department

Academic level: 300 Level

Semester in which course is offered: Second (Spring) Semester

Course pre-requisite(s): IS312 - Database Systems 2

Credit Hours: 3

Contact Hours Through:

Lecture	Tutorial *	Practical *	Total
2.5	0.0	1.5	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification: January 2015

II. Overall Aims of Course

The aim of this course is to introduce the students to data warehousing concepts and its wide range of applications. In addition students will learn the steps to build a data warehouse starting from designing a multidimensional schema to model their data warehouse, until using analysis and report tools to get useful information needed for decision making. The students will also study data cubes and how they are used to visualize the different measures. Finally, the DX query language is presented in the practical sessions along with other tools so that the students by the end of the course are ready to build a fully functional data warehousing system.

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K10,K14,K17,K22]	[I2,I12,I19]	[P4,P8,P13,P14]	[G2,G3,G5,G9]



Course Specification

IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

- K.1 Define and describe the role of data warehouses in decision making.
- K.2 Recognise how to incorporate managerial requirements into the data warehouse dimensional model.
- K.3 Describe the life cycle of designing a data warehouse.
- K.4 Explain the fundamental concepts and techniques used in designing data warehouses.
- K.5 Interpret data quantitatively and predict future trends through mining.

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Distinguish the main differences between data warehouses and traditional database systems.
- I.2 Analyze data quantitatively for efficient decision making.
- I.3 Predict future trends and patterns.
- I.4 Propose solutions for the different problems that they can face during their design and implementation.

c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Manipulate data integrated from heterogeneous sources.
- P.2 Demonstrate ability to use data warehouses in different decision making problems.
- P.3 Employ data warehousing design tools and software.
- P.4 Use analytical tools to efficiently analyze both historical and current data.

d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Infer vague requirements and transform them into a logical model.
- G.2 Design a data warehouse that satisfies managerial needs and use available resources.
- G.3 Defend the need for data warehouses.
- G.4 Present his/her system in a professional way.
- G.5 Work in a team.

V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	Introduction to Decision Support Systems and data warehouses	1	All			
2-	Data warehouses definition	1	K1,K4		P3	
3-	Data Warehouse design issues	2	All	I4	P1,P3	
4-	Data warehouse components	1.5	K1, K4	I1	P1	
5-	Snapshots and introduction to dimensional modeling	2	K4	I1,I4		



Course Specification

6-	Data Cubes	1	K2,K5	I1,I2,I3	P4	
7-	DW in retail store, Inventory, Procurement and order management Case studies	1.5	All	I4	P2	All
8-	CRM, Human Resources, Transportation and Financial services case studies	1	All	I4,I2	P2	All
9-	Accounting, Telecommunication, and Education case studies	1	All	I4	P2	All
10-	Insurance, Health, and E-Commerce case studies	1	All	I4,I3	P2	All
	Net Teaching Weeks	13				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours *
1	Introduction to Decision Support Systems and data warehouse goals and architecture	2.5	2.5	
2	-- Data warehouses definition, the main characteristics of DW and how they are fulfilled. -- Introduction to DW tools and software	4	2.5	1.5
3	-- Data Warehouse design issues: Granularity and partitioning. -- Intro to SQL Server tools in lab	4	2.5	1.5
4	-- Data warehouse components: data source, ETL, data marts. -- Developing a Star Schema from Adventure Work Sample in lab	4	2.5	1.5
5	-- Snapshots and introduction to dimensional modeling, and Star Schema and Snowflake schema, differences between different schemas, and advantages of dimensional modeling, and DW visualization through data cubes. -- Continue with more examples and queries for ETL process from Adventure Work Sample	4	2.5	1.5
6	-- DW in retail store and Inventory Case studies. -- Building cube using analysis services in lab	4	2.5	1.5
7	Midterm Exam			



Course Specification

8	-- Procurement and order management case studies -- Introduction to MDX	4	2.5	1.5
9	-- CRM and Human Resources case studies -- Continue with MDX	4	2.5	1.5
10	-- Transportation and Financial services case studies -- Advanced MDX examples	4	2.5	1.5
11	-- Accounting and Education case studies -- How to create a calculated member in cubes using SSAS?	4	2.5	1.5
12	-- Telecommunication case study -- Lab Review	4	2.5	1.5
13	-- Insurance and Health case studies -- MDX exam	4	2.5	1.5
14	-- E-Commerce case study -- Project delivery	4	2.5	1.5
15	Final Exam			
Total Teaching Hours		51	33	18

* No Practical/Tutorial during the first week of the semester

VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	✓	All	I1,I4	P2	G3
Tutorials					
Computer lab Sessions	✓	K3	I2,I3	P1,P3,P4	G2
Practical lab Work	✓	K3	I2,I3	P1,P3,P4	G2
Reading Materials	✓	All	I4	P2	G3
Web-site Searches					
Research & Reporting					
Problem Solving / Problem-based Learning	✓	K4	I4	P2	G2,G3
Projects					
Independent Work					
Group Work	✓	K2,K3		All	G1,G2,G5
Case Studies	✓	All	I4		G3
Presentations	✓				All
Simulation Analysis					
Others (Specify):					



Course Specification

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	✓	All	I1,I4			10%	7
Final Exam	✓	All	I1,I4			60%	15
Quizzes	✓	All	I1,I4			3%	4,8
Course Work							
Report Writing							
Case Study Analysis	✓	K4		P2,P3	G2,G3	2%	8
Oral Presentations	✓	K4	I4	P2	G1,G2,G3	5%	8
Practical	✓			P1,P3	All	5%	10
Group Project	✓		I2,I3,I4	All	All	15%	13
Individual Project							
Others (Specify):							

IX. List of References

Essential Text Books	<ul style="list-style-type: none"> Building the data warehouse, Willian H. Inmon, 4th edition 2005 Data Warehousing toolkit: The Complete Guide to Dimensional Modeling, Ralph Kimball, and Margy Ross, 2nd edition, ISBN 0-471-20024-7, John Wiley and Sons Inc. 2002
Course notes	<ul style="list-style-type: none"> Course Lecture notes Lecture notes on introduction to data warehouses by Katherine Splett
Recommended books	<ul style="list-style-type: none"> Data Modeling Techniques for Data Warehousing, Chuck Ballard, Dirk Herreman, Don Schau, Rhonda Bell, Eunsang Kim, Ann Valencic, http://www.redbooks.ibm.com Oracle9iR2 Data Warehousing, by Lilian Hobbs, Susan Hillson and Shilpa Lawande
Periodicals, Web sites, etc ...	<ul style="list-style-type: none"> Microsoft Training and Certification, Microsoft Official Curriculum, Module 6: Writing MDX Statements, 1999



Course Specification

X. Facilities required for teaching and learning

List the facilities required

- Software: MS SQL Server 2000 (Enterprise Manager, Analysis Services, and MDX Sample Application)
- Software: MS Office 2000 or Higher

Course coordinator: Ass. Prof. Dr. Hoda Mokhtar

Head of Department: Ass. Prof. Ehab Ezzat

Date: January 2015