ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specification

Data Warehousing
14023301-3

Course Specification

Institution **Umm Al Qura University**	Date of Report: **07-1437 / 04-2016**
College/Department **College of Computers and Information Systems** **Information Systems Department**	

A. Course Identification and General Information

1. Course title and code:
Data Warehousing
14023301-3

2. Credit hours
3 credits

3. Program(s) in which the course is offered.
Information Systems, Bachelor of Science

4. Name of faculty member responsible for the course
Dr Mohamed Nour

5. Level/year at which this course is offered
: 3rd year after preparatory / level 7

6. Pre-requisites for this course (if any): 14022301-3 Database 1

7. Co-requisites for this course (if any)

8. Location if not on main campus:
Delivered in the four locations where the Information Systems BSc is given:
- Al Abidiyya main campus boys section,
- Al Zahir main campus girls section,
- Al Qunfuda Boys section,
- Al Qunfuda Girls section.

9. Mode of Instruction (mark all that apply)

a. Traditional classroom	X	What percentage?	100%
b. Blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. Correspondence		What percentage?	
f. Other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? Data warehousing has drawn increasing interest within the software enterprises to gain critical insights of daily business analytic operations. Data warehouse as a tool provides comprehensive analysis of operational data and to identify patterns. This course provides an introduction to fundamental techniques and novel applications of data warehouse. Issues covered by this learning experience include data warehouse fundamentals, planning, business analytics modeling, data warehouse design and implementation. In particular, the role of data warehouse in supporting business intelligence and effective decision making is emphasized through labs, projects and case studies. Further, it involves an in-depth study of various concepts needed to design and develop a data warehouse. This course is designed to expose students to concepts, enabling methods and hands-on usage and problem solving in an integrated way. As one of IS depth electives, it provides a good balance between theory and practice. The participants will explore applications and have great opportunity for hands-on experimentation with data warehousing and reporting tools.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1 Topics to be Covered		
List of Topics	No of Weeks	Contact hours
Introduction to Data warehousing • Concepts • Operational and informational systems • Decision support systems? • Applications of data warehouse	1	3
Data warehouse architecture • Source systems • Process flow • Extract & load process & load manager • Clean & transform data & warehouse manager • Query manager • Detailed & Summarized information • Backup and archive process • Data staging area & presentation servers	2	6

Data Warehouse Design
• ER modeling vs. Dimensional modeling
• Online Analytical Processing (OLAP)
• ROLAP,MOLAP &HOLAP
• Database schema and Dimensional Modeling
  ○ Facts
  ○ Dimensions
  ○ Fact & Dimension Tables
  ○ Star, Snowflake & Starflake schemas
	2	6

Case Study: Data Warehouse for a Grocery Store	1	3
Advanced dimensional modeling concepts • Surrogate keys • Slowly changing dimensions • Rapidly changing dimensions • Conformed dimensions • Factless fact tables • Minidimensions • Outriggers • Role-playing dimensions	1	3
Multi-dimensional databases (MDDBs)	1	3
Performance enhancing techniques • Partitioning • Aggregation • Materialization of views • Bitmap indexes • Parallel processing	1	3
Case Study: Academic data warehouse	1	3
Data Marts • Architecture • Design • Cost	1	3
Metadata	1	3
Data Warehouse Project Management	1	3
Advanced design issues • Hardware and operation design • Security • Backup and recovery • Capacity planning	1	3
Reporting	1	3
Business Intelligence	1	3

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	48					48
Credit	3					3

3. Additional private study/learning hours expected for students per week.	2

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The ***National Qualification Framework*** provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Know the definition and applications of a data warehouse.	Lectures Case studies	Quizzes and/or Online Quizzes, Midterm, Final Exam
1.2	Know the architecture and processes of a data warehouse.	Lectures Case studies	Quizzes and/or Online Quizzes, Midterm, Final Exam
2.0	**Cognitive Skills**		
2.1	• Understand dimensional modeling and design database schemas for a data warehouse.	Lectures	Quizzes and/or Online Quizzes, Midterm, Final Exam
2.2	• Understand dimensional modeling concepts and specific case studies.	Lectures	Quizzes and/or Online Quizzes, Midterm, Final Exam
2.3	• Understand and implement various techniques used to reduce the query response time.	Lectures	Quizzes and/or Online Quizzes, Midterm, Final Exam
2.4	• Understand the role of data marts in data warehousing.	Lectures	Quizzes and/or Online Quizzes, Midterm, Final Exam
2.5	• Understand the data warehouse project management techniques.	Lectures	Quizzes and/or Online Quizzes, Midterm, Final Exam
3.0	**Interpersonal Skills & Responsibility**		
3.1	Understand the importance of reporting in a data warehouse.	Lectures	Quizzes and/or Online Quizzes, Midterm, Final Exam
3.2	Understand the increasing analytical needs of an organization.	Lectures	Quizzes and/or Online Quizzes,

			Midterm, Final Exam
4.0	**Communication, Information Technology, Numerical**		
4.1	N/A		
4.2			
5.0	**Psychomotor**		
5.1	N/A		
5.2			

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

NQF Learning Domains	Suggested Verbs
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
Cognitive Skills	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise
Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
Communication, Information Technology, Numerical	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize
Psychomotor	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct

Suggested ***verbs not to use*** when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification.

Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Quiz	3, 6, 9,12, 15	20%
2	Mid term	8	30%
4	Final exam	Exam week	50%

D. Student Support

1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

E Learning Resources

1. Required Text(s) Kimball R, *et al.* (2008). *The Data Warehouse Toolkit: Practical Techniques for Building Data Warehousing and Business Intelligence Systems.* Second Edition, John Wiley.
2. Essential References
3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List) Reema Thareja, 2009. Data warehousing. Oxford University Press, USA. ISBN: 0195699610. John Wang, 2005. Encyclopedia of Data Warehousing and Mining. Idea Group.
4-.Electronic Materials, Web Sites etc
5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.)
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching • Online –any time- feedback electronic form • End of term Feedback
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching • Offering training sessions & Workshops • Providing specialized educational journals

4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution) • External Examiners • Marking an exam by a Group of faculty members; each marks a question of the exam for example.
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. • Study and analyse the feedback from students. • Compare the learning outcomes with real students' results and skills they have gained. • Review the course periodically by the curriculum committee to check with ACM requirements and top universities.. • Review the course periodically by the quality assurance unit.

Faculty or Teaching Staff: _____

Signature: _____ **Date Report Completed:** _____

Received by: _____ **Dean/Department Head: Dr. Skander Turki**

Signature: _____ **Date: 07-1437 / 04-2016**