City University of Hong Kong
Course Syllabus

offered by Department of Electronic Engineering
with effect from Semester B in 2017/2018

Part I Course Overview

Course Title:	Multi-Dimensional Data Modeling and its Applications
Course Code:	EE6435
Course Duration:	One Semester (13 weeks)
Credit Units:	3
Level:	P6
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	EE2331 Data Structures and Algorithms
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

This course aims to provide a fundamental understanding in the multi-dimensional data model design principles, together with their implementation, basic operations, and analytical functionalities. The course also provides students with the know-how of multi-dimensional data models which can be used in strategy planning and analysis to help entrepreneurs overcome the challenges in an ever changing technology driven industrial environment.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the concept of multi-dimension data model, and the building block of a multi-dimensional data model.		✓		
2.	Explain the basic operations that can be performed on a multi-dimensional data model and the analytical functionalities.		✓	✓	
3.	Identify and perform the steps involved in designing a multi-dimensional data model and its applications.		✓	✓	✓
4.	Demonstrate how the multi-dimensional data models are used in strategic planning and analysis using case studies.		✓	✓	✓
5.	Realistic industrial Implementation of multi-dimensional data modelling.		✓	✓	✓
		100%			

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4	5		
Lecture	Key concepts of multi-dimensional data modelling are described and illustrated	✓	✓	✓	✓			2 hrs/wk
Tutorials	Key concepts are worked out based on questions and problem solving	✓	✓	✓				1 hr/wk
Assignment	Each student is required to independently work on 1-2 assignments. Each assignment contains several questions designed to help students reinforce the concepts/operations learned.		✓	✓	✓			
Mini-project	Each student is required to apply multi-dimensional data modelling. In such a project, a student needs to design multi-dimensional models, construct user interfaces, implements data input and data output processes.				✓	✓		

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting	Remarks
	1	2	3	4	5			
Continuous Assessment: 40%								
At least 3 assignments (assignments, mini-project etc.)		✓	✓	✓	✓		40%	
Examination: 60% (duration: 2hrs)								
							100%	

Remark:

To pass the course, students are required to achieve at least 30% in course work and 30% in the examination.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Examination	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal level
2. Coursework	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal level

6. Constructive Alignment with Programme Outcomes

PILO	How the course contribute to the specific PILO(s)
1,2,3	The course provides students with opportunities in acquiring knowledge of multi-dimensional data modelling techniques, and also the applications of mathematics and engineering problem solving skills which are central to the aims of this program.
4, 5	Students are required to complete a min-project designed to gain practical experience in implementing a business solution using a multi-dimensional data model. The analytical and research skills developed are central to the aims of this program.

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

Fundamental of multi-dimensional model
OLAP; data structures ; industrial informatics.

Basic operations on multi-dimensional model
rollup; spreading; slice; dice; cube view creation: roll dimension, column dimension, filter dimension; MDX expression.

Application of multi-dimensional model
The mini-projects in the case studies are designed to complement the lecture aspects of the course, and to gain practical but industrial experience by applying multi-dimensional analysis tools targeting the electronic industry. The mathematic and engineering skills developed are central to the aims of this course.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	OLAP Solutions: Building Multidimensional Information Systems (2nd Edition) by Erik Thomsen, Wiley Computer Publishing, Apr 18 2002, ISBN-13: 978-0471400301
2.	The Data Warehouse Toolkit: The Complete Guide to Dimensional Modeling (2nd Edition) by Ralph Kimball, Wiley Computer Publishing, Apr 26 2002, ISBN-13: 978-0471200246
3.	IBM Cognos TM1 The Official Guide by Karsten Oehier, McGraw-Hill Osborne Media, Feb 22 2012, ISBN-13: 978-0071765695
4.	http://www.palo.net