AT71.08 Data Modeling and Management 3(2-3)	Semester: August 2020 @AIT																
Course Plan: Lecture (2 hours), Lab (3 hours)	*** Subject to change according to the real class pacing!**																
Topics	**W1**	**W2**	**W3**	**W4**	**W5**	**W6**	**W7**	**W8**	**W9**	**W10**	**W11**	**W12**	**W13**	**W14**	**W15**	**W16**	**W17**
0. Introduction	x																
Course Syllabus and Expected Learning Outcomes	x																
Introduction to Data Modeling and Management	x																
I. Recall: Relational Data Model and Management		x	x	x													
Relational Model Concepts		x															
SQL		x															
Relational Database Management Systems (RDBMSs)		x															
Entity Relationship Model (ER Model)			x	x													
Relational Database Design and Normalization			x	x													
Lab1 : MySQL and SQL Workbench	**Lab1 (takehome)**																
Lab2 : SQL-DDL commands			**Lab2**														
Lab3 : SQL-DML commands			**Lab3**														
Lab4 : Advanced SQL-DML commands				**Lab4**													
Mini Project #1: RDB Design and Implementation (ideation / discussion / consultation / final presentation)					o	o											
II. NoSQL Data Modeling and Management							x	x		x	x						
NoSQL Concepts and Characteristics							x	x		x	x						
Major Categories of NoSQL Data Models							x	x		x	x						
NoSQL Database Design							x	x		x	x						
NoSQL Features and Operations							x	x		x	x						
Lab5 : Key-Value Store							**Lab5**										
Lab6 : Document Store								**Lab6**									
Lab7 : Column-family Store										**Lab7**							
Lab8 : Graph Store											**Lab8**						
Mini Project #2: NoSQL Design and Implementation (ideation / discussion / consultation / final presentation)												o	o				
III. Data Distribution												x					
Data Sharding and Replication Models												x					

emester Exam (20%)

inal Exam (25%)

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CAP Theorem									**Mid-se**			**x**					**Fi**
IV. Transaction Processing and Consistency Models													**x**				
Transaction Processing Concepts													**x**				
ACID Model													**x**				
BASE Model													**x**				
V. Data Engineering													**x**				
Business Understanding													**x**				
Data Acquisition and Understanding													**x**				
Data Cleansing													**x**				
Data Preparation, Transformation and Feature Engineering														**x**			
Lab9: Data Engineerinng (ETL) #1														**Lab9**			
Lab10 : Data Engineerinng (ETL) #2														**Lab10**			
VI. Applications and Case Studies		**x**	**x**	**x**			**x**	**x**		**x**	**x**						
VII. Large Scale Data Handling															**x**		
Big Data characteristics															**x**		
Big Data Modeling and Management															**x**		
VIII. Introduction to Related Topics																**x**	
Data Security																**x**	
Data Privacy and Legal Issues,																**x**	
Data Governance: Social and Ethical Issues, Biasness (gender, religions, etc.)																**x**	