Addis Ababa Science and Technology University
College of Electrical and Mechanical Eng.
Department of Software Engineering

Addis Ababa Science and Technology University						
1	College: Electrical and Mechanical Engineering			Department: Software Engineering		
2	Course Category	Core Course		Category Code:1		
	Course Name	Database Systems				
	Course Code:	SWEG2108				
3	Synopsis:	This course is intended enable students to implement different concepts from the very basic to advance SQL on a variety of DBMS. It starts by dealing with introduction to SQL like SQL Data Definition, SQL Data Manipulation, Basic Structure of SQL Queries, Nested Subqueries and Additional Basic Operations. Then it goes to working with Intermediate SQL like Join Expressions, Views, Integrity Constraints, Transactions, Authorization. Lastly, the advanced SQL like Trigger, Concurrency Control Techniques, Database Recovery Techniques, Database Security and Authorization Enhanced Data Models for Advanced Applications will be covered. Finally, besides to the concept of SQL Systems, the NoSQL systems will be briefly introduced.					
4	Name(s) of Academic Staff:	Yaynshet Medhin Assefa				
5	Semester and Year offered:	Semester:	II	Year:	2	
6	Credit Hour:	4				
7	Prerequisite/ Co-requisite: (if any)	None				
8	Course Learning Outcome (CLO): At the end of the course the student will be able to					
	CLO1	Explain fundamentals of database system concepts, technology and practice and apply to groom into well-informed database application developers				
	CLO2	Analyze and identify a model of conceptual, logical and physical design for a given database				
	CLO3	Design a given database and demonstrate it for applications using a popular DBMS				
	CLO4	Apply Database Design (DBD) and Data Manipulation Language (DML) Tasks for a give DBMS.				

9 Mapping of the course Learning Outcomes to the program Learning Outcomes, Teaching Methods and Assessment:

Course Learning Outcomes (CLO)	Program Learning Outcomes (PO)												Teaching Methods	Assessment				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		Test	Quiz	Assi	Proj	Lab-

														L	T	P	O				
	CLO1	√												√		√		√			
	CLO2		√											√					√		
	CLO3			√										√		√		√			√	√
	CLO4					√								√		√					√	
	Indicate the relevancy between the CLO and PO by ticking "√" on the appropriate relevant box																					

10	Transferable Skills (if applicable) (Skills learned in the course of study which can be useful and utilized in other settings)	
	1.	Learn how to Organize and structurally store large data in different database related systems.
	2.	Learn how to manage Databases in different web-based applications
	3.	Learn database design approaches in system analysis and modeling.

11 Distribution of Student Learning Time (SLT)

Course Content Outline	CLO	Teaching and Learning Activities						Total (SLT)
		Guided learning (F2F)				Guided Learning (NF2F)	Independent Learning (NF2F)	
		L	T	P	O			
Chapter 1: Introduction to Database Systems								
1.1 History of database system 1.2 The approaches of data management 1.3Database Management System 1.4 Database development life cycle 1.5 Roles in Database Design and Use 1.6 DBMS Environment	1	8.5	-	4.5	-	2	2	17
Chapter 2: Data Models								
2.1 Over view of the different data Models 2.2 Building block of relational data Model 2.3 Properties of relational data								

	model 2.4 SQL components 2.5 Entity, Attribute, Entity set 2.6 Types of attributes 2.7 Degree of relationship 2.8 Cardinality of relationship	2	7	-	11	-	8	11	37
	Chapter 3: Database Designs								
	3.1 Relational and non-relational data base design 3.2 Relational constraint/integrity rule 3.3 Key constraint 3.4 Relational view 3.5 Instance, schema 3.6 ER Model and diagram 3.7 Mapping ER into Relational Tables 3.8 Relational algebra and calculus concepts 3.9 Relational algebra operators	3	12.5	-	8	-	1.5	12	34
	Chapter 4: Database Normalization								
	4.1 Database Normalization 4.2 Purpose of Normalization 4.3 Data redundancy and anomalies examples 4.4 Functional dependency 4.5 Formal definition of the normal forms with examples	3,4	2.5	-	6	-	-	5	13.5
	Chapter 5: SQL and NoSQL Systems								
	5.1 Introduction to SQL/NoSQL 5.2 Creating and connecting a data base								

	5.3 Creating tables 5.4 Insert data into tables 5.5Updating/deleting/alter/drop/ wild cards... 5.6 Joining tables 5.7 Functions in SQL 5.8 Math in SQL 5.9 Group by and order by 5.10 Transactions and Views, Integrity Constraints, Authorization and Triggers 5.11 NoSQL Systems 5.12 Key-value database 5.13 Columnar Databases 5.14 Document databases with MongoDB	3,4	11.5	-	12.5	-	4.5	12	40.5
	Total		42	-	42	-	16	42	142

Assessment

Continuous Assessment		Percentage Total-50(%)	F2F	NF2F	SLT
1	Tests	15 %	1.5	1	2.5
2	Tests	10 %	1.5	1	2.5
3	Project	20 %	1	7	8
4	Quiz	5 %	1	1	2
Total					15

Final Exam	Percentage 50 (%)	F2F	NF2F	SLT
Final Exam	50	2	1	3
			Grand Total SLT	160

L = Lecture, T = Tutorial, P = Practical, O = Others, F2F = Face to Face, NF2F = Non-Face to Face

Note: indicates the CLO based on the CLO's numbering in item 9.

12	Special requirements and resources to deliver the course	1	Software
		2	Computer Lab

13	Reference Books:	1	R. Elmasri and S. B. Navathe, "Fundamentals of. Database Systems," 7th Edition, Addison Wesley
		2	Silberschatz, Korth, and Sudarshan. *"Database System concepts – 7th Edition"*, McGraw Hill, 2002.
		3	Date C.J. *"An Introduction to Database Systems – 8th Edition"* Addison-Wesley
		4	Connolly T. & Begg C. *"Database Systems – 6nd Edition"* Addison Wesley.