UNIVERSITY OF THE PHILIPPINES MANILA
COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF PHYSICAL SCIENCES AND MATHEMATICS
MATHEMATICAL AND COMPUTING SCIENCES UNIT

Course Code: CMSC 127	**Course Title:** Introduction to Database Systems	
Credit Units: 3	**Lecture Unit(s):** 2 units; 2 hrs/week	**Laboratory Unit(s):** 1 unit; 3hrs/week
Course Description The course includes overview of the database development process, entity relationship diagrams, relational analysis including normalization, physical database design, SQL, object-oriented databases, client-server and internet database environment, XML, transaction processing and concurrency control, data warehousing and data mining. Students will be required to develop an information systems project to illustrate how they applied the concepts discussed during the lectures.		
Instructional Materials and References: 1. Hoffer, J., Venkataraman, R., Topi, H. Modern Database Management, 11th Edition, Prentice Hall, 2012 2. Elmasri, R. Navathe, S., Fundamentals of Database Systems, 6th Edition, Addison-Wesley, 2010 3. Connolly, T., Begg, C., Database Systems: A Practical Approach to Design, Implementation, and Management, 6th Edition, Addison-Wesley, 2014 4. J. C. Date. An Introduction to Database Systems, 8th Edition. Addison-Wesley, 2003 5. Silberschatz, A., Korth, H., and Sudharshan, S., Database System Concepts, 6th Edition, Mc Graw Hill, 2011.		

Program/Student Outcomes

1. Incorporate the latest developments in Computer Science and Information Technology in the design of software systems for various applications
2. Create innovative solutions through research and development projects in Computer Science
3. Exhibit moral, ethical and social responsibilities as a professional and as a Filipino citizen
4. Work collaboratively in teams
5. Communicate computing solutions effectively

Course Outcomes

1. Understand data models, schemas, instances, and their applications in the real world
2. Design effective database schemas using Entity Relationship Diagram (ERD)
3. Apply knowledge using CASE Tools.
4. Perform effective data management procedures
5. Master how to write complex database queries in SQL
6. Implement a small-scale database application

COURSE OUTCOMES	TOPICS	TIME FRAME	INTENDED LEARNING OUTCOMES	TEACHING-LEARNING ACTIVITIES	METHOD OF ASSESSMENT
Understand data models, schemas, instances, and their applications in the real world	Lecture: Introduction to Databases Database Development Process Laboratory: Exercise (Advantages of databases, costs and risk of database approach, database activities per phase in the systems development life cycle)	Week 1	To be able to understand the evolution of database systems from traditional file processing approach to hierarchical, network, and relational database systems, to object-relational, Object-oriented	Lecture/Class discussion Exercises	Exercise
Design effective database schemas using Entity Relationship Diagram (ERD)	Lecture: Entity Relationship Diagram Laboratory: ERD Exercises on Paper	Week 2 - 3	To be able to develop ER diagrams for logical design of database systems	Lecture/Class discussions Exercises/Boardwork Assignment	Exercise/Boardwork Assignment
Apply knowledge using CASE Tools. Implement a small-scale database application	Lecture: Overview of Project Requirements Laboratory: Hands-on exercise on designing the ER Diagram using a featured CASE Tool (Visual Paradigm or MSVisio) Group Dynamics	Week 5	To appreciate the importance of group dynamics/teamwork in the development of small scale database projects through brain storming and joint requirements planning	Group Discussion Demo of sample project CASE Tools for ER Diagramming (Ex. MS Visio, Visual Paradigm)	Submitted/presented solution using selected CASE tool
Perform effective data management procedures	Lecture: Relational Analysis Laboratory:	Week 6	To apply normalization to create well-structured relations	Lecture/Class discussions Exercises/Boardwork	Exercises/Boardwork

	Exercise on Relational Analysis				
Perform effective data management procedures	Lecture: Physical Database Design Laboratory: Exercise on Physical Database Design	Week 7	To create a database design for storing data that will provide adequate performance based on volumetric estimates, response time expectations, data security needs, integrity expectations and backup and recovery needs	Lecture/Class discussions Classroom Exercises Exercise/Boardwork	Exercise/Boardwork
Master how to write complex database queries in SQL	Lecture: SQL Laboratory: Hands-on exercise on SQL (phpMyAdmin/Oracle, sqlzoo.net)	Week 8 – 9	To implement the database design in a target database platform. To be able to write SQL statements that can create and alter the database structure, perform record search and update (insert, edit, and delete), control access to the database	Lecture/Class discussions Classroom Exercises, Assignment Hands-on activity 1) (MySQL/Oracle) 2) SQLZoo: Interactive SQL Tutorial http://sqlzoo.net/	Exercise/Boardwork Assignment Hands-on activity
Implement a small-scale database application	1st Group Project Presentation	Week 10		Group Project Presentation	Group Project Presentation
	1st Exam	Week 11		Exam	Exam
Understand data models, schemas, instances, and their applications in the real world	Lecture: Object-oriented database modeling Laboratory: Hands-on exercise on UML Class Diagram (Designing class diagrams using a featured CASE Tool (Visual Paradigm or MS Visio))	Week 12	Model real-world application using UML class diagrams. Understand similarities and differences between traditional ERD and UML class diagrams	Class lecture/discussion Exercises Hands-on activity	Exercises Hands-on activity

Perform effective data management procedures	Lecture: Client/Server Systems and Internet Database Environment; Transaction Processing and Concurrency Control Laboratory: Project Consultation	Week 13	Explain the 3 components in a client/server system (presentation layer, processing layer, storage layer) Understand transaction processing and concurrency control concepts	Class lecture/discussion Exercises	Exercises
	2nd Exam	Week 14		2nd Exam	2nd Exam
Implement a small-scale database application	Final Project Presentation	Week 15	To implement a small scale database application on a target platform	Group Project Presentation	Group Project Presentation
	Final Exam	Week 16		Final Exam	Final Exam

Course Requirements

Lecture (50%)		
Exercises (Seatwork, Boardwork, Assignments)	**5%**	**50%**
Long Exams	**30%**	
Final Exam	**15%**	
Laboratory (50%)		**50%**
Project (45%)		
Attendance and Collaboration	**10%**	
Quality	**25%**	
Documentation	**10%**	
Hands-on Exercises	**5%**	
Grand Total		**100%**

Classroom Policies:

1. The grade in the Lecture component should be not lower than 50% (i.e. 50% of 50%). This is to ensure that the student gains minimum understanding of the concepts and pass not just because of high marks in the lab
2. Missed exam rule: A student is allowed to make up for only one missed exam, provided that the reason is valid. If another exam is missed, the student will get a zero in that exam. The special exam is usually scheduled after the Finals and covers all topics of the entire course
3. Cheating during an examination is a major offense. A student caught cheating during exams will automatically be given a grade of 5.0
4. Absence of more than 20% of the total number of meetings could result to a grade of 5.0
5. A student may officially drop the course on or before the deadline for dropping. Only after a dropping slip is accomplished and the instructor's copy is submitted, can a student be considered officially dropped from the course.

GRADING SCALE

≥ 93	90–92	87–89	84–86	80–83	75–79	70–74	65–69	60–64	55–59	≤ 55
1.0	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0	4.0	5.0

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Consultation Hours: Mon 10:30am – 12:00nn; Wed 9:00am – 12:00nn, 1:00pm – 4:30pm; Fri 5:30pm – 7:30pm