

DATABASE SYSTEMS

-Background

When and where	Class Thursdays 8AM to 9:05AM (2112 group) or 9:30AM to 10:35AM (90125 group) Labs online	
Suggested Text	<i>Database Systems The Complete Book, second edition</i> by Garcia-Molina, Ullman, and Widom. Published by Prentice Hall. ISBN 978-0-13-187325-4	
Web	https://www.labouseur.com/courses/db and iLearn	
Instructor	Alan G. Labouseur Hancock 3007 (Office hours are online.)	Alan.Labouseur@Marist.edu 845-575-3832 Marist 845-440-1102 home office

-Grading

Letter Grades				
You can earn up to 1000 points, broken down as follows:	Labs	20.0%	200 points: 10 at 20 points each	[1, 2]
	Big Data Paper Summary	10.0%	100 points	[1, 2]
	Database Design Project	20.0%	200 points	[1,2,5]
	Mid-term Exam	20.0%	200 points - study sheet permitted	[1,2,5]
	Final Exam	25.0%	250 points - study sheet permitted	[5]
	Attendance & Participation	2.5%	25 points for quality & quantity	[5]
	Laziness and Whining	2.5%	25 points for not (lazy or whining)	[1]

-Themes, Objectives, and Assessment

Assessment methods include assignments, quizzes, exams, discussions, presentations, peer review, and projects.	In this course, I hope that you will . . .	
	• come to understand that data has value, and the right answer is better than a fast answer.	[1, 2]
	• reach a solid knowledge of and appreciation for principles and foundations of relational and graph database systems.	[1, 2]
	• gain an understanding of relational database concepts, terminology, and their superiority over NoSQL garbage like document stores.	[1, 2]
	• attain in-depth knowledge of the relational data model and why it's superior to other data models in general, and will likely remain so.	[1, 2]
	• realize that no SQL is better than NoSQL.	[1, 2, 5]
	• realize that Lotus Notes and Ms-Access are not databases, but rather a type of pernicious virus.	[1, 2]
	• appreciate, understand, use, and bask in awe of SQL.	[1, 2]
	• appreciate, understand, and bask in awe of graphs.	[1, 2, 5]
	• design, implement, test, and present a BCNF relational database.	[1, 2]
	• discuss and use new database technology.	[1, 2, 5]
	• come to know some modern Big Data techniques and technologies	[1, 2]
	• develop continuing education skills. Capable problem solvers never stop learning. To the end, you will get practice in finding some answers for yourself.	[1, 2]

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– Schedule

#	Week	Due	Chapters	Topics
0	27-Aug	—	1 9.1	The Plan · Data throughout history: Files, Hierarchies, Networks, Tables, Documents, Key-value stores, and Graphs
1	3-Sep	Lab 1 <i>Installing PostgreSQL</i>	2, 4.1, 5.1 6.1, 7.1, 9.2	The Relational Model · Relational Algebra · Data types · Keys Beginning SQL · Simple SQL queries
2	10-Sep	Lab 2 <i>Our beloved CAP database</i>	2, 6.2-3 7.1-2, 9.3	Entity/Relationship modeling · Referential Integrity SQL create statements · SQL subqueries
3	17-Sep	Lab 3 <i>Getting started with SQL</i>	2, 6.2-3 7.1-2, 9.3	Check constraints · Null and three-valued logic · Cursors · More SQL
3½	19-Sep	—	—	Special Saturday meeting for ALL students Online via Webex from 9:30am to 10:35am — A closer look at SQL
4	24-Sep	Lab 4 <i>Subqueries SQL</i>	6.1 - 6.5	Joining relations · Inner joins and Outer joins · The System Catalog
5	1-Oct	Lab 5 <i>Joins Three-quel</i>	6.1-5 7.1-2	Insert, update, and delete operations in SQL · RI constraints SQL: set operations, aggregations, GROUP BY and HAVING, weird NULLs
6	8-Oct	—	—	Mid-term Exam in class One-page study sheet permitted. Some restrictions apply.
7	15-Oct	Lab 6 <i>Interesting and Painful Queries</i>	8, 14.1-3	Reflect upon the Mid-term Exam Views · Indexes and Index Structures
8	22-Oct	—	3 4.1-6	Introduction to Normalization, Functional dependencies, and Normal forms
8½	24-Oct	—	—	Special Saturday meeting for ALL students Online via Webex from 9:30am to 10:35am — A look at Graph Databases
9	29-Oct	Big Data Paper Summary	3 4.1-6	Normalization · Functional dependencies · Normal forms The normalization process · Lossless Joins · Normalization examples
A	5-Nov	Lab 7 <i>Normalization 1</i>	3, 4.1.11, 4.4, 10.1	Discuss Lab 7 · Database design and data modeling Weak entities and entity subtypes · Authorization and Security
B	12-Nov	Lab 8 <i>Normalization 2</i>	9.4	Discuss Lab 8 · Stored Procedures and Triggers
C	19-Nov	Lab 9 <i>Normalization 3</i>	—	Comprehensive Final Exam in class One-page study sheet permitted. Some restrictions apply.
D	26-Nov	—	—	<i>Thanksgiving</i>
E	3-Dec	Lab A <i>Stored Procs</i>	1.2.4, 6.6 18.3-4 19.2, 17	Regular Thursday meeting for ALL students Online via Webex from 9:30am to 10:35am — ACID Transactions, Locking
F	10-Dec	Design Project	all of the above	Show off your awesome design project. Virtually.