





What is a database?

A database provides efficient shared access to persistent data.

Introduction to Databases

Home	Course is a foreign key in the StudentsTakingCourses table, since it references the primary key Course in the Courses table.											
Spreadsheet	Students StudentsTakingCourses											
	oludomo											
Questions	Name		Classification		Major		🍸 🕩 🌹 🍸	Course	Semester			
	Jeff Carte	r 1111	Junior	0	Computer Science		1111	CSE 303	SP2010			
Anomalies	Anne Penr	iy 2222	Senior	0	Computer Science		1111	CSE 220	FA2010			
	Fred Hopew	/ell 3333	Freshman		Math		2222	ENG 476	SP2010			
Database	Andrew Spo	oth 4444	Junior	English			2222	CSE 303	SP2010			
	Valerie Duni	bar 5555	Freshman		Math		3333	MAT 118	FA2010			
Breakdown							3333	ENG 110	SP2010			
	Courses						3333	MAT 243	SP2010			
Relations	🔶 Course	Cours	eTitle	Credits			4444	MAT 118	FA2010			
	CSE 303	Computati	on Theory	3	-		4444	ENG 476	SP2010			
Keys	CSE 220	Data St	ructures	2			5555	CSE 303	SP2010			
	ENG 476	Old English Lit		4			5555	ENG 110	SP2010			
Queries	MAT 118		College Algebra				5555	MAT 118	FA2010			
	ENG 110	Ameri	can Lit	2								
Checkpoint	MAT 243	MAT 243 Discrete Math		3								
Slow Medium Fact		Discret	e man	3								
Slow Medium Fast	Play Intro	Prin	nary I	Gold '	Foreign I		Orange I	Review	0	Step		

- How are relational databases different from spreadsheets?
- How do databases use keys to identify and relate information?
- What is a query?

Databases for Many Majors: More to Explore

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http://databasesmanymajors.faculty.asu.edu

Visualizations designed for students of any major to understand the fundamental concepts of databases

- IntroDB: Introduction to Databases
- QueryDB: Introduction to Querying
- DesignDB: Conceptual Database Design

Introduction to Querying

	Home									
	Query	select T.Semester from Students S. Stu								
Sets				when	e S.ID = S.Nai	= T.ID and me = "Jef				
Filtering					T.Cot	urse = "C				
Joining		Last, list the attributes wanted in the query								
	SQL									
	Checkpoint									
			S	Stud	lents					
				Name		= "Jeff				
				I	D					
				Classi						
				Ma	ajor					
	Slow Medium Fast	Play Intro	Design '	From	Where '	Select				

- What operations are needed to filter and combine data to answer queries?
- What language is used to ask the database questions?



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Checkpoints: Quiz Yourself!





Conceptual Database Design



- related?







Database queries are puzzles!



What concepts are to be stored in the database and how are they

• How do you map/translate the diagram/picture of the design to relational tables?



APPLIED COMPUTING MAJORS

Applied Computing students learn fundamental computer science and achieve advanced technical expertise, while also understanding how these important skills operate in the real-world. Students engage in interdisciplinary connections at ASU's West campus to apply their knowledge through internships and research, preparing for high-demand careers in computing, especially cybersecurity, databases and networks.

APPLIED COMPUTING MINOR ACO 201*, ACO 240, ACO 320, ACO 330, ACO 350 * Prerequisites: ACO 101 and ACO 102

B. S. Applied Computing School of Mathematical and Natural Sciences New College of Interdisciplinary Arts and Sciences Arizona State University at the West campus http://newcollege.asu.edu/mns

Degree Requirements

- Lower-level Applied Computing: CS1 (AC0 101), CS2 (ACO 102), Data Structures & Algorithms (ACO 201), **Programming Languages (ACO 240)**
- Math: **Brief Calculus (MAT 210)**, Discrete Math (MAT 243), **Statistics (STP 226)**
- **Upper-level Applied Computing:** 1 Database (ACO 320),
- 1 Network (ACO 330),
- 1 Operating Systems (ACO 350),
- **3 Databases/Networks/Cybersecurity**
- Internships (ACO 484) and/or Research (ACO 499) [2 3-credit courses]

Explore interdisciplinary opportunities by adding a minor or even a concurrent degree in another field, such as applied math, business, communications, life sciences, psychology, sociology or statistics!

Research Opportunities for Undergraduates!



New College Undergraduate Inquiry and Research Experiences

Sample Research Projects

- **Database Animations for Many Majors**
- **BullyBlocker: Cyberbullying detection in Facebook**
- **Discover the Interest of Twitter Users**
- **Modeling Network Traffic of Mobile Internet Devices**
- SimDB: Fast identification of similar pictures in database systems
- **Vulnerability of Wireless Home Networks: Hacking into WPA**





Networks

Cybersecurity

Engaging undergraduates in research collaboration with faculty

http://newcollege.asu.edu/ncuire













INTERDISCIPLINARY!

Computing can be combined with many disciplines!