

COURSE SYLLABUS

DATABASE

Course code: 220096

1. General information

<i>Course type</i>		<i>Number of credits</i>	<i>Number of learning periods</i>
General	<input type="checkbox"/>		
Basic	<input checked="" type="checkbox"/>	Theory: 02	Theory: 30
Specialized	<input type="checkbox"/>	Exercise:	Exercise:
Required	<input checked="" type="checkbox"/>	Practice: 01	Practice: 30
Elective	<input type="checkbox"/>		

Learners:

Level	Bachelor
Discipline	Information Technology

Course requirements:

Prerequisites	Discrete mathematics
Parallels	None
Other requirements	None

2. Learning resources

Books	[1] Hector Garcia-Molina, Jeff Ullman, Jennifer Widom. (2008). <i>Database Systems: The Complete Book</i> . Pearson - Prentice-Hall. [2] Nguyễn Văn Ty, Đỗ Phúc (2010). <i>Giáo trình Cơ sở dữ liệu</i> . NXB Đại học Quốc gia.
References	[3] Nguyễn Kim Anh (2004). <i>Nguyên lý các hệ cơ sở dữ liệu</i> . NXB Đại học Quốc gia Hà nội. [4] Nguyễn Tuệ (2009). <i>Giáo Trình Nhập Môn Hệ Cơ Sở Dữ Liệu</i> . NXB Giáo dục.

Other learning materials	[5] Microsoft, <i>Microsoft SQL Server 2014</i>
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3. Course description

The course provides students basic knowledge on database systems and design principles of database schema. The course also aims to provide opportunities to practice professional skills including representing relational expression using relational algebra, inspecting integrity constraints, normalizing database relational models and writing queries using SQL. Additionally, the course develops students’ appropriate awareness and attitudes on database systems as well as required soft skills related to the course content.

4. Course learning outcomes (CLOs)

After finishing the course, students will be able to:

		Satisfy LOs of the program	Satisfy LOs of the ABET
❖ Topic 1: Disciplinary Knowledge and Reasoning			B.1.1
L1.	Describe overview about databases	1.2.4	B.1.2
L2.	Use relational algebra to write queries		B.1.3
L3.	Inspecting integrity constraints of relational databases		B.1.4
L4	Normalize relation models		B.1.5
L5	Write query using SQL language		B.1.6
❖ Topic 2: Personal and Professional Skills and Attributes			
L6	Problem identification and formulation	2.1.1	
L7	Modeling problems	2.1.2	
L8	Thinking holistically	2.3.1	
L9	Survey of print and electronic literature	2.2.2	
L10	Curiosity and lifelong learning	2.4.6	
L11	Professional ethics, integrity, responsibility and accountability	2.5.1	
❖ Topic 3: Interpersonal Skills: Teamwork and Communication			
L12	Team operation	3.1.2	
L13	Oral presentation and interpersonal communications	3.2.6	

L14	Communications in foreign languages: English	3.3.2	
❖ Topic 4: Conceiving, Designing, Implementing and Operating Systems in The Enterprise, Societal and Environmental Context – The Innovation Process			
L15	Defining function, concept and architecture	4.2.2	
L16	The design process	4.3.1	
L17	Utilization of knowledge in design	4.3.3	
L18	Designing the implementation process	4.4.2	
L19	Test, verification, validation, and certification	4.5.1	

5. Course content

<i>Course content</i>	<i>CLOs</i>	<i>Number of learning periods</i>		
		<i>Theory</i>	<i>Practice</i>	<i>Others</i>
Chapter 1. Database overview	L1	4	0	
1.1. Concepts: database (DB), database management system (DBMS), database system				
1.2. Characteristics of DB and DBMS				
1.3. DB users				
1.4. Approaches on DBs				
1.5. Basics concepts: conceptual data model, relational data model				
1.6. 1.6. Keys of relational model: Primary key and Foreign key				
1.7. 1.7. Designing phases and designing principles of data models.				

<input type="checkbox"/> <i>Personal and Professional Skills and Attributes</i>	L6 L9(T); L10 → L11(U)			
<input type="checkbox"/> <i>Interpersonal Skills: Teamwork and Communication</i>	L14(I)			
<input type="checkbox"/> <i>CDIO in the enterprise, societal and environmental context</i>	L15(T)			
Chapter 2. Relational algebra	L2	7	0	
2.1. Concepts and operators in relational algebra				
2.2. Writing queries using relational algebra				
2.3. Query optimization				
<input type="checkbox"/> <i>Personal and Professional Skills and Attributes</i>	L6 → L11(U)			
<input type="checkbox"/> <i>Interpersonal Skills: Teamwork and Communication</i>	L12 → L14(U)			
<input type="checkbox"/> <i>CDIO in the enterprise, societal and environmental context</i>	L15(U); L16(T)			
Chapter 3. Integrity Constraints in Relational database	L3	4	0	
3.1. Concept of integrity constraints				
3.2. Classification of integrity constraints				
3.3. Features of integrity constraints				
<input type="checkbox"/> <i>Personal and Professional Skills and Attributes</i>	L6(U); L11(U)			
<input type="checkbox"/> <i>Interpersonal Skills: Teamwork and Communication</i>	L12(U); L14(U)			
<input type="checkbox"/> <i>CDIO in the enterprise, societal and environmental context</i>	L15(U)			
Chapter 4. Relation Normalization	L4	10	0	

4.1. Concepts: functional dependency, closure, key and normalization				
4.2. Characteristics of functional dependencies				
4.3. Armstrong's axioms and inference rules				
4.4. Computing the closure of attributes				
4.5. Computing the closure of a set of functional dependencies				
4.6. Computing keys of a relational model				
4.7. Normal forms and normalization of relational models				
<input type="checkbox"/> <i>Personal and Professional Skills and Attributes</i>	L6(U); L11(U)			
<input type="checkbox"/> <i>Interpersonal Skills: Teamwork and Communication</i>	L12; L14(U)			
<input type="checkbox"/> <i>CDIO in the enterprise, societal and environmental context</i>	L15(U)			
Chapter 5. Structured Query Language (SQL)	L5	5	30	
5.1. Introduction to SQL				
5.2. Data-definition language				
5.3. Data manipulation language				
5.3. Data control language				
5.5. Association between SQL and relational algebra language				
<input type="checkbox"/> <i>Personal and Professional Skills and Attributes</i>	L6(U); L11(U)			

<input type="checkbox"/> <i>Interpersonal Skills: Teamwork and Communication</i>	L12(U); L14(U)
<input type="checkbox"/> <i>CDIO in the enterprise, societal and environmental context</i>	L15(U); L16(U); L17(T); L19(T)
Summary of skills in course level	
<input type="checkbox"/> <i>Personal and Professional Skills and Attributes</i>	L6(U) →L11(U)
<input type="checkbox"/> <i>Interpersonal Skills: Teamwork and Communication</i>	L12(U) → L14(U)
<input type="checkbox"/> <i>CDIO in the enterprise, societal and environmental context</i>	L15(U) → L16(U); L17(T) →L19(T)

6. Teaching and learning methods

ID	Teaching method/technique		Description
M1.	Lecturing	<input checked="" type="checkbox"/>	
M2.	Questions – Answers	<input checked="" type="checkbox"/>	
M3.	Group-based Learning	<input checked="" type="checkbox"/>	
M4.	Problem-based Learning	<input type="checkbox"/>	
M5.	Project-based Learning	<input type="checkbox"/>	
M6.	Case studies	<input checked="" type="checkbox"/>	
M7.	Role play	<input type="checkbox"/>	
M8.	Demo	<input checked="" type="checkbox"/>	
M9.	Simulations	<input type="checkbox"/>	
M10.	Debate	<input type="checkbox"/>	
M11.	Game	<input type="checkbox"/>	

M12.	Brainstorming	<input type="checkbox"/>	
M13.	Think-Pair-Share	<input type="checkbox"/>	

7. Course assessment

ID	Assessment activity		Quantity	Weight	LOs assessed
T1.	Text-based midterm exam	<input checked="" type="checkbox"/>		25%	L1 → L4
T2.	Text-based final exam	<input checked="" type="checkbox"/>		25%	L1 → L5
T3.	Practice midterm exam	<input checked="" type="checkbox"/>		25%	L5, L19
T4.	Practice final exam	<input type="checkbox"/>			
T5.	Report	<input type="checkbox"/>			
T6.	In-class exercises	<input checked="" type="checkbox"/>		25%	L1 →L5, L19
T7.	Homework assignments	<input type="checkbox"/>			
T8.	Question – Answer	<input type="checkbox"/>			
T9.	Term Project	<input type="checkbox"/>			
T10.	Final Exam	<input checked="" type="checkbox"/>		50%	L1 □L5
Formula for Overall score		<p>Progress assessment: T6 and one of {T1, T2, T3}</p> <p>Final assessment: T10</p> <p>Overall score = Progress assessment score + Final assessment score</p>			

8. Course requirements and expectations

8.1. Requirements on attendance

- Students are responsible for attending all classes. In case of absence due to force majeure circumstances, there must be sufficient and reasonable evidence.
- Students who do not attend more than 20% of the class sections, whether for reason or not, are deemed not to have completed the course and must re-enroll in the following semester.

8.2. Requirements and expectations on student behaviors

- Students must show their respects for teachers and other learners.
- Students must be on time. Students who are late more than five minutes will not be allowed to attend the class.
- Students should not make noise and interfere with others in the learning process.
- Students should not eat, chew gum, and use devices such as cell phones, music players during class hours.
- Laptops and tablets can only be used in class for the purpose of learning.
- Students who violate the above principles will be asked to leave the class and considered absent from the class.

8.3. Requirements on learning issues

Issues related to applying for score reservation, scoring complaints, scoring, exam disciplines are done according to the Learning Regulation of Tra Vinh University.

9. Tentative course instructor

Ha Thi Thuy Vi

DEAN

DEPARTMENT HEAD

LECTURER

Ha Thi Thuy Vi