

SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

SYNTHESIZED SCHOOL PROGRAM

ACADEMIC UNIT: Escuela Superior de Cómputo

ACADEMIC PROGRAM: Ingeniería en Sistemas Computacionales

Distributed DataBase.

LEARNING UNIT:

LEVEL: III

AIM OF THE LEARNING UNIT :

The student implements Distributed Database Systems through mainly design methodologies and architectural alternatives for distributed database.

CONTENTS:

- I. Distributed Systems.
- II. Distributed Database System.
- III. Distributed Database Architectures.
- IV. Design of a Distributed Database.

TEACHING PRINCIPLES:

The professor will apply a Projects-Based learning process, through analogical methods using analysis techniques, technical data, charts, cooperative presentation, exercise solving and the production of the learning evidences. Moreover, an autonomous learning will be encouraged by the development of a final project.

EVALUATION AND PASSING REQUIREMENTS

The program will evaluate the students in a continuous formative and summative way, which will lead into the completion of project portfolio. Some other assessing methods will be used, such as revisions, practical's, class participation, exercises, learning evidences and a final project.

Other means to pass this Unit Learning:

- Evaluation of acknowledges previously acquired, with base in the issues defined by the academy.
- Official recognition by either another IPN Academic Unit or by a National or International external Academic Institution besides IPN.

REFERENCES:

- Elmasri, R. Navathe, S. B. (2007). *Fundamentos de Sistemas de Bases de Datos.* (Quinta Edición). Madrid España: Pearson/Addison Wesley ISBN: 978-84-7829-085-7.
- Stefano, C, Giuseppe, P. (1985). *Distributed Databases Principles & Systems*. Estados Unidos: Mc Graw-Hill Inc. ISBN: 978-0070108295.
- Tamer, M. O., Valduriez P.(1999). *Principles of Distributed Database Systems*. (Second Edition). Estados Unidos: Prentice Hall. ISBN: 978-0136597070.
- Tanenbaum A.S., Van Steen M. (2007). *Sistemas Distribuidos Principios y Paradigmas*. (Segunda Edición). México: Pearson Education Prentice Hall. ISBN: 978-970-26-1280-3.
- Wujuan, L., Veeravalli, B. (2003). Object Management in Distributed Database System for Stationary and Mobile Computing Environments: A Competitive Approach. USA: Kluwer Academic Publishers. ISBN: 978-1-4020-7600-8.



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

ACADEMIC UNIT: Escuela Superior de Cómputo

ACADEMIC PROGRAM: Ingeniería en Sistemas Computacionales

LATERAL OUTPUT: Analista Programador de Sistemas de Información

FORMATION AREA: Professional

LEARNING UNIT: Distributed DataBase.

TYPE OF LEARNING UNIT: Theorical – Practical Optative. **VALIDITY:** August 2011

LEVEL: III

CREDITS: 7.5 TEPIC - 4.39 SATCA

MODALITY: Presence

ACADEMIC AIM

Furthermore, this program to provide the knowledge to design distributed database systems, being caused the independent learning by means of the use of tools and methods; developing abilities to use different algorithms in the partitioning and data allocation for different sites at distributed database. It contributes to the debit profile reinforcing it integration of the knowledge of other Units of Learning to plan, to negotiate and to foment the analysis skills; designing and coordinating projects in the context of distributed systems and database topics. It dominates the practical and methodological principles, aspects for the construction of systems. Decision making, solution of problems, assertive communication, and creative, strategic thought. This unit has the units Data Base as antecedents.

AIM OF LEARNING UNIT:

The student implements Distributed Database Systems through mainly design methodologies and architectural alternatives for distributed database.

CREDITS HOURS	LEARNING UNIT DESIGNED BY: Academia	AUTHORIZED BY: Comisión de
THEORETICAL CREDITS/WEEK:3.0	de Ingeniería de Software	Programas Académicos del Consejo
PRACTICAL CREDITS/WEEK:1.5	REVISED BY:	General Consultivo del IPN. 2011
THEORETICAL HOURS/SEMESTER:54 PRACTICAL HOURS/SEMESTER:27 AUTONOMUS LEARNING HOURS: 54 CREDITS HOURS/SEMESTER:81	Dr. Flavio Arturo Sánchez Garfias Subdirección Académica APPROVED BY: Ing. Apolinar Francisco Cruz Lázaro Presidente del CTCE.	Ing. Rodrigo de Jesús Serrano Domínguez Secretario Técnico de la Comisión de Programas Académicos



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

Distributed DataBase

LEARNING UNIT:

PAGE: 3 OUT OF 10

THEMA	THEMATIC UNIT: TITLE: Distributed Systems						
The stu	UNIT OF COMP dent relates issues of Distributed Systems, through its c	ETENC	E ristics				
No.	CONTENTS	Teach instru HOI	er led- iction JRS	Auton Lear HO	omous ning URS	REFERENCES KEY	
		т	Р	т	Р		
1.1 1.1.1	Introduction to Distributed Systems Definition of a Distributed System.	0.5		1.5		7B	
1.2 1.2.1 1.2.2 1.2.3 1.2.4	Issues of Distributed System. Openness. Transparency. Issues for Open System. Scalability	2.5		3.0	1.5		
1.3 1.3.1 1.3.2 1.3.3	Sorts of Distributed Systems. Distributed Computing System. Distributed Information System. Distributed Pervasive System.	2.0		3.0	1.5		
	Subtotals:	5.0	0.0	7.5	3.0		
This Th	TEACHING PRINCIPLES This Thematic Unit must begin with a framing of the course and the formation of teams. Will be Projects-Based learning strategy, trough analogical method, with the techniques of elaboration of charts, concent mapping, exhibition in team						

practical and production of learning evidence and the accomplishment of a project proposal.

LEARNING EVALUATION

Diagnostic Test Project Portfolio: Charts Concept Mapping Cooperative Presentation Proposal of project Practical w/report Self-Evaluation Rubrics Cooperative Evaluation Rubrics Written Learning Evidence	5% 5% 10% 20% 5% 5% 30%
Written Learning Evidence	30%



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

Distributed DataBase

LEARNING UNIT:

PAGE: 4 **OUT OF** 10

THEMA	THEMATIC UNIT: II TITLE: Distributed Database System						
The stu	UNIT OF COMP dent compares characteristics of a Distributed Database	System	E n throug	h terminolo	ogy of Distr	ibuted Processing.	
No.	CONTENTS	Teacher led- instructionAutonomo Learning HOURSHOURSHOURS		Teacher led- instructionAutonomous Learning HOURSNTENTSHOURS		omous ning URS	REFERENCES KEY
		Т	Р	т	Р		
2.1 2.1.1	Distributed Database Definition.	0.5		1.0		8C,1B, 4C	
2.2 2.2.1 2.2.2	Distributed Database Management System Components. Advantages	0.5		1.0	1.0		
2.3	Distributed Processing and Distributed Databases.	0.5	0.5	1.0	1.0		
2.4	Distributed Database Transparency Features.	1.0	0.5	1.0	1.0		
2.5	Data Fragmentation.	1.5	0.5	1.0	1.0		
2.6	Data Replication.	0.5	0.5	1.0	1.0		
2.7	Data Allocation.	0.5		1.0	1.0		
	Subtotals:	5.0	2.0	7.5	6.0		
TEACHING PRINCIPLES Will be projects-Based learning strategy, trough analogical method, trough analogical method, with the techniques of elaboration of charts, concept mapping, exhibition in team, advance of the project, practical and production of learning evidences.							
	LEARNING EVA	LUATIO	N				

Project Portfolio:	
Report of Practicals	20%
Concept Mapping	5%
Cooperative Presentation	5%
Advance of the Project	20%
Self-Evaluation Rubrics	5%
Cooperative Evaluation Rubrics	5%
Writing Learning Evidence	40%



SECRETARÍA ACADÉMICA

DIRECCIÓN DE EDUCACIÓN SUPERIOR



LEARNING UNIT:

Distributed DataBase

PAGE: 5 **OUT OF** 10

THEMATIC UNIT: III

TITLE: Distributed Database Architectures.

UNIT OF COMPETENCE The student compares architectural models and architectural alternatives for distributed database through reference a models for distributed database.

No.	CONTENTS	Teacher led- instruction HOURS		Autonomous Learning HOURS		REFERENCES KEY	
		Т	Р	т	Р		
3.1 3.1.1 3.1.2 3.1.3	Architectural Model for Distributed Database Management System. Autonomy Distribution Heterogeneity Architectural Alternatives	2.0		3.0	1.5	6B, 2C, 3C, 5B	
3.2.1 3.2.1 3.2.2 3.2.3	Distributed Database Management System Architecture Client/Server System Distributed Database System Multidatabase Architecture	1.0	1.0	3.0	3.0		
3.3 3.3.1 3.3.2 3.3.3 3.3.4	Reference architecture for distributed database. Global Conceptual Schema Fragmentation Schema Allocation Schema Characteristics of Reference architecture for distributed database.	2.0	1.0	3.0	1.5		
	Subtotals:	5.0	2.0	9.0	6.0		
		NCIPLE	S				

Will be projects-Based learning strategy, trough analogical method, trough analogical method. with the techniques of elaboration of charts, concept mapping, exhibition in team, advance of the project, practical and production of learning evidences.

LEARNING EVALUATION

Project Portfolio:	
Report of Practical	20%
Charts	5%
Concept Mapping	5%
Advance of the Project	20%
Self-Evaluation Rubrics	5%
Cooperative Evaluation Rubrics	5%
Writing Learning Evidence	40%



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

Distributed Database

LEARNING UNIT:

PAGE: 6 **OUT OF** 10

THEMA	THEMATIC LINIT: 11/					
		ETENC	F	L. Design		
The stu	dent designs a Distributed Database System through ar	1 alterna	Live desi	ign strateg	у.	
No.	CONTENTS	Teacher led- instructionAutonomous Learning HOURS		omous ning URS	REFERENCES KEY	
		Т	Р	т	Р	
4.1 4.1.1 4.1.2	Alternative Design Strategies Top-Down Design Process Bottom- Up Design Process	1.0				6B
4.2 4.2.1 4.2.2 4.2.3	Fragmentation. Reasons for Fragmentation. Fragmentation Alternatives. Correctness Rules of Fragmentation.	2.0		2.0		
4.3 4.3.1 4.3.2 4.3.3	Fragmentation Alternatives Horizontal Fragmentation. Vertical Fragmentation. Hybrid Fragmentation.	1.5	1.5	4.0	4.0	
4.4 4.4.1 4.4.2 4.4.3	Allocation Allocation Problem. Information Requirements. Allocation Model.	1.5	0.5	3.0	2.0	
	Subtotals:	6.0	2.0	9.0	6.0	
Will be exercise and the	TEACHING PRI projects-Based learning strategy, trough analogical me e-solving, cooperative presentation, practical and learn presentation of the final project.	NCIPLE ethod, tro ing evid	S ough an lence, th	alogical m ne producti	ethod. with ion of the	the techniques of learning evidences

LEARNING EVALUATION

Project Portfolio:	
Report of Practical	20%
Exercise-solving	5%
Concept Mapping	5%
Final Project	20%
Self-Evaluation Rubric	5%
Cooperative Evaluation Rubrics	5%
Writing Learning Evidence	40%



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

LEARNING UNIT:

Distributed DataBase

PAGE: 7 **OUT OF** 10

RECORD OF PRACTICALS

No.	NAME OF THE PRACTICAL	THEMATIC UNITS	DURATION	ACCOMPLISHMENT LOCATION
1	Relational Database Management System.	1,11	5.0	Computer Labs
2	Centralized Database Architecture System.	II	6.0	
3	Multidatabase architecture System.	111	8.0	
4	Partitioning Algorithms for distributed database.	IV	8.0	
		TOTAL OF HOURS	27.0	
EVALUATIO	N AND PASSING REQUIREMENTS:			
The practicals Practicals are	worth 20% in each thematic unit. considered mandatory to pass this unit learn	ing.		



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

LEARNING UNIT:		Distributed DataBase		PAGE:	8	OUT OF	10
PERIOD	UNIT		EVALUATION TER	MS			
1	I	Continuous evaluation Written Learning Evidence	70% 30%				
2	II	Continuous evaluation Written Learning Evidence	60% 40%				
	111	Continuous Evaluation Written Learning Evidence	60% 40%				
3	IV	Continuous Evaluation Written Learning Evidence The learning Unit I is 20% wo The learning Unit II is 20% wo The learning Unit III is 30% w The learning Unit IV is 30% w Other means to pass this Lea • Evaluation of ackno defined by the acade • Official recognition b International external If accredited by Special Asse guidelines established by the	60% 40% orth of the final score. orth of the final score.	cquired, N Academic esides IPI of proficie	with ba Unit or N. ency, it v g for this	se in the i r by a Natio will be based s purpose.	ssues nal or d on



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

LEARNING UNIT:

Distributed DataBase

PAGE: 9 **OUT OF** 10

KEY	В	С	REFERENCES
1	X		Elmasri, R. Navathe, S. B. (2007). <i>Fundamentos de Sistemas de Bases de Datos.</i> (Quinta Edición). Madrid España: Pearson/Addison Wesley ISBN: 978-84-7829-085-7.
2		X	Mannino, M. V. (2007). Administración de bases de datos, diseño y desarrollo de aplicaciones. (Tercera Edición). México: Mc Graw Hill Interamericana. ISBN: 978-970-10-6109-1.
3		X	Ricardo C. M.(2009). Bases de Datos. México D.F.: Mc Graw Hill. ISBN: 978-970-10-7275-2.
4		x	Rob, P., Coronel C. (2004). <i>Sistemas de Bases de Datos</i> . (Quinta Edición). México DF: Thompson Learning Course Technology. ISBN: 970-686-2862.
5	x		Stefano, C, Giuseppe, P. (1985). <i>Distributed Databases Principles</i> & <i>Systems</i> . Estados Unidos: Mc Graw-Hill Inc. ISBN: 978-0070108295.
6	x		Tamer, M. O., Valduriez P.(1999). <i>Principles of Distributed Database Systems</i> . (Second Edition). Estados Unidos: Prentice Hall. ISBN: 978-0136597070.
7	x		Tanenbaum A.S., Van Steen M.(2007). <i>Sistemas Distribuidos Principios y Paradigmas</i> . (Segunda Edición). México: Pearson Education –Prentice Hall. ISBN :978-970-26-1280-3.



SECRETARÍA ACADÉMICA



DIRECCIÓN DE EDUCACIÓN SUPERIOR

TEACHER EDUCATIONAL PROFILE PER LEARNING UNIT

1. GENERAL INFORMATION

ACADEMIC UNIT:	Escuela Superior de Cómputo				
ACADEMIC PROGRAM: Ingeniería en Sistemas Computacionales LEVEL III					
FORMATION AREA:	Institutional	Basic Scientific	Professional	Terminal and Integration	
ACADEMY: Ingeniería	de Software LEARNING U		NIT: Dis	tributed DataBase.	
SPECIALTY AND ACADEMIC REQUIERED LEVEL: Masters Degree or Doctor in Computer Science					

2. AIM OF THE LEARNING UNIT:

The student implements Distributed Database Systems through mainly design methodologies and architectural alternatives for distributed database.

3. PROFESSOR EDUCATIONAL PROFILE:

KNOWLEDGE	PROFESSIONAL EXPERIENCE	ABILITIES	APTITUDES
 Data Modeling Distributed System SQL Standard Distributed Database Management System Architecture Knowledge of the Institutional Educational Model English Language 	 A year designs computational systems A year experience develop database systems Two Years working in groups and work collaborative. A year experience in the Institutional Educational Model. 	 Analysis and synthesis. Leadership. Decision Making. Problems resolution. Applications of Institutional Educational Model. Distinguish architectural models and architectural alternatives for distributed database. 	 Responsible. Honest. Respectful. Tolerant. Assertive. Colaborative. Participative.

DESIGNED BY

REVISED BY

AUTHORIZED BY

M. en C. Euler Hernández Contreras COORDINATING PROFESSOR

Dra. Lorena Chavarría Báez COLLABORATING PROFESSORS Dr. Flavio Arturo Sánchez Garfias Subdirector Académico Ing. Apolinar Francisco Cruz Lázaro Director