

SOFTWARE AND DATABASE SYSTEMS SECURITY

1. GENERAL

SCHOOL	ENGINEERING		
DEPARTMENT	INFORMATICS AND COMPUTER ENGINEERING		
LEVEL OF STUDY	POSTGRADUATE (7)		
M.Sc. Program	CYBERSECURITY		
COURSE UNIT CODE	CSCYB205	Semester	2o
COURSE TITLE	Software and Database Systems Security		
COURSEWORK BREAKDOWN		Weekly Duration	ECTS
	Lectures	3	
	Problem Solving- Research	1	
Tutorials		4	7
COURSE UNIT TYPE	Specialisation		
PREREQUISITES :	None		
LANGUAGE OF INSTRUCTION/EXAMS:	English, Greek		
MODULE WEB PAGE (URL)			

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B Guidelines for writing Learning Outcomes

- Understand the risks involved in publishing data
- - Know the existing options for secure databases
- - Design more secure databases
- - Be able to protect customer data from attacks

GENERAL SKILLS

- - Understand the main concept of big data and the security trends and risks of modern applications
- - Know which data should be protected - Understand the capabilities of cryptographic protocols
- - The skills to select the most appropriate cryptographic solutions for a given security problem

3. COURSE CONTENT

The description contains the material that will be covered during 13 lectures, with the following topics

1. - Discretionary and mandatory access control

2. - Security protection possibilities of the SQL language
3. - Privacy protection for relational, spatial and graphical data
4. - Protecting the privacy of data that changes over time
5. - Digital watermarking and fingerprinting in relational databases.
6. - Encrypted databases and recovery of encrypted data
7. - Security in statistical and distributed databases
8. - Security of large data sets
9. - Data security and privacy in online social networks.
10. - Integration and security of big data

4. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	Face to face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	<ul style="list-style-type: none"> • Use of ICT in the teaching of courses • Use of the Open e-Class system, with posted notes, lectures, exercises for practice and communication with students. 	
TEACHING METHODS	Method description	Semester Workload
	Lectures	39
	Practice /Exercise	26
	Research work	50
	Study	60
	Total	175
ASSESSMENT METHODS	I. Written final examination (20%) and II. Research paper (80%)	

5. RESOURCES

Essential

- *Privacy Preserving Data Publishing: An Overview, Synthesis Lectures on Data Management*, 2010, Raymond Chi Wing Wong, Ada Wai Chee Fu
- Rakesh Agrawal and Jerry Kiernan. 2002. *Watermarking relational databases. In Proceedings of the 28th international conference on Very Large Data Bases*
- *Database management systems*, 3rd. Ed., Ramakrishnan Raghu, Gehrke Johannes . (Chapter 24)
- *Fundamentals of Database Systems*, 7th Edition, Elmasri Ramez, Navathe Shamkant B.B (Chapter 17)

Recommended

- Chen, Bee Chung & Kifer, Daniel & LeFevre, Kristen & Machanavajjhala, Ashwin. (2009). *Privacy Preserving Data Publishing. Foundations and Trends in Databases.*
- Fung, Benjamin & Wang, Ke & Chen, Rui & Yu, Philip. (2010). *Privacy Preserving Data Publishing: A Survey of Recent Developments. ACM Comput. Surv. 42. Watermarking Techniques for Relational Databases: Survey, Classification and Comparison, Raju Halder, Shantanu Pal and Agostino Cortesi*