

SYLLABUS:

Date / Revision April 2017/September 2017/IT
Faculty Engineering
Study Program Computer Science

SUBJECT: IT SECURITY 3

1 Basic Information

1.01	Subject Name	IT SECURITY 3 (Database and Application Security)
1.02	Semester	6
1.03	Level	1
1.04	SKS	2
1.05	Mandatory / Curriculum	D-06
1.06	Subject Code	OTSE
1.07	Subject Code	CSE-D-OTSE-317
1.08	Year	2017
1.09	Quality Control	Final Test, see evaluation
1.10	Limitations	Min 12 and Max 32 students in one class
1.11	Combined with	
1.12	Perquisite	IT Security 1 (Information Security) & IT Security 2 (Network Security)
1.13	Responsible	
1.14	Revision	September 2017

2 Description of Subject

This course concerns about security controls to protect databases and applications, which include stored functions, database systems, and database servers against their confidentiality, integrity and availability. Many layers and types of information security control will be discussed, which include access control, authentication, and Integrity controls

3 Objectives

To provide student with knowledge, skill and experience about database security, and its future development. It also to formulate a working definition of database security and administration.

4 Competency

- Understand data security tools such as access control mechanisms, authentication and cryptographic.
- Able to design and implement to protect data in databases.
- Able to implement database and application auditing

5 Learning Approach / Methodology

- Lectures/ Class contact (time-tabled) supplemented with interactive questions and answers;
- Student Study Effort: homework/assignment; preparation for test/quizzes/ examination.

6 Evaluation

5.1	Absence maximum	25%
5.2	Participation in Discussion	05 Points
5.3	Homework / Classwork	05 Points
5.4	Presentation /Simulation	10 Points
5.5	Daily Quiz	20 Points
5.6	Final Examination	60 Points
	Total	100 Points

7 Text Book and Reference

1	Main Text Book: Database and Applications Security, Integrating Information Security and Data Management, Bhavani Thuraisingham, Auerbach Publications, 2005, ISBN-10: 0849322243 (hard cover)
2	Supplement Textbooks: Security for Relational Databases, Osama S. Faragallah et. al, CRC Press 2015, 978-1-4822-0540-4 (ebook)

8 Content / Topics of Lecture

Week	Content/Topics of Lecturing	Text Book Chapter	Rem
1	Trends, Supporting Technologies for Database and Applications Security, Discretionary Security in Database Systems, Multilevel Secure Data Management, Multilevel Secure Relational Data Models and Systems, Inference Problem, Secure Distributed Database Systems, Secure Object and Multimedia Data Systems, Data Warehousing, Data Mining, Security, and Privacy, Secure Web Information Management Technologies, Emerging Secure Information Management Technologies, Organization of This Book, Next Steps	Chapter 1: Introduction	
2	Relational and Entity-Relationship Data Models, Architectural Issues, Database Design, Database Administration, Database Management System Functions, Distributed Databases, Heterogeneous Database Integration, Federated Databases, Client/Server Databases, Migrating Legacy Databases and Applications, Data Warehousing, Data Mining, Impact of the Web, Object Technology, Other Database Systems, Summary and Directions	Chapter 2: Data Management Technologies	
3	Information Retrieval Systems, Multimedia Data and Information Management, Digital Libraries, Knowledge Management, Collaboration and Data Management, E-Commerce Technologies, Semantic Web Technologies, Wireless and Sensor Information Management, Real-Time Processing and Quality-of-Service Aspects, High-Performance Computing Technologies, Some Other Information Management Technologies, Summary and Directions	Chapter 4: Information Management Technologies	
4	Access-Control Policies, Administration Policies, Identification and Authentication, Auditing a Database System, Views for Security	Chapter 5: Security Policies	
5	Mandatory Access Control, Security Architectures	Chapter 8: Design Principles	
6	Granularity of Classification, Polyinstantiation, Toward Developing a Standard Multilevel Relational Data Model, Summary and Directions	Chapter 9: Multilevel Relational Data Models	
7	Query Processing, Transaction Processing, Storage Management, Metadata Management, Other Functions, Prototypes and Products, Prototypes, Products, A Perspective of the Inference Problem	Chapter 10: Security Impact on Database Functions	
8	Midterm Break		

9	Security Constraints, Approach to Security Constraint Processing, Consistency and Completeness of the Constraints, Design of the Query Processor, Design of the Update Processor, Handling Security Constraints During Database Design, Security Control Processing and Release Control	Chapter 13: Security-Constraint Processing for Inference Control	
10	Architectures, Data Modeling, Functions, Inference Problem for a MLS/DDBMS	Chapter 16: Multilevel Security for Distributed Database Systems	
11	Architectures, Schema Integration, Policy Integration, Functions, Inference Problem, Secure Client/Server Database Management, Secure Migration of Legacy Databases and Applications	Chapter 17: Secure Heterogeneous and Federated Database Systems	
12	Security for Object Request Brokers, Object Modeling for Secure Applications	Chapter 19: Aspects of Objects and Security	
13	Security for Multimedia Data Management Systems, Secure Geospatial Information Systems	Chapter 20: Secure Multimedia Data Management Systems	
14	Secure E-Commerce, Secure Workflow and Collaboration, Secure Knowledge Management, Secure Peer-to-Peer Data Management, Secure Dynamic Coalitions and Virtual Organizations, Trust and Rights Management, Security Informatics	Chapter 26: Secure E-Commerce, Collaboration, and Knowledge Management	
15	Final Examination		