**Philadelphia University**

Faculty of Information Technology

Department of Information Security and Cyber Security

First Semester 2024/2025



**Course Information**

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| **Title:** | **Database Administration Security (0790312)** |
| **Prerequisite:** | Database Fundamentals (0731221). |
| **Credit Hours:** | 3 credit hours (Duration: 16 weeks, 80 hours in total, Lectures: 48 hours (3 hours per week)). |
| **Textbook:** | "Database Security Problems and Solution", Christopher Diaz, 1th edition, David Pallai, Mercury Learning and Information., 2022. |
| **References:** | * Philadelphia University E-Learning System (Moodle + MS Teams). * Lemahieu, W., vanden Broucke, S. and Baesens, B., 2018. Principles of database management: the practical guide to storing, managing and Analyzing big and small Data. Cambridge University Press. * McDowall, R.D., 2018. Data integrity and data governance: practical implementation in regulated laboratories. Royal Society of Chemistry. * Thuraisingham, B., 2005. Database and applications security: Integrating information security and data management. Auerbach Publications. * Natan, R.B., 2005. Implementing database security and auditing. Elsevier. * Wagner, J., 2020. Auditing database systems through forensic analysis. DePaul University. |
| **Course Description:** | This course will provide an overview of database security concepts and techniques and discuss new directions of database security in the context of Internet information management. The topics will cover database application security models, database and data auditing, XML access control, trust management and privacy protection. |
| **Instructor:** | Associate Professor. Maram Bani Younes  **Email**: [mbaniyounes@philadelphia.edu.jo](mailto:mbaniyounes@philadelphia.edu.jo)  **Office**: Information Technology building, room 6718,  **Office hours**: Sun, Tue : 10:00- 10:50 |
| **Technology Requirements** | * Personal computer, laptop, or mobile phone. * Internet Connection. * Access to Philadelphia University E-Learning Portal (MS Teams and Moodle) |
| **Learning Style** | Blended: |
| **Communication** | * Announcement: the announcements will be posted in MS Teams or Moodle on a regular basis. * Email. * MS Teams or Moodle chats. |

**Course Objectives:**

This course aims to:

* Demonstrate an understanding of basic database concepts and security architecture.
* Understand the security of the database models.
* Understand and employ a multilevel secure relational model.
* Demonstrate the auditing in relational databases
* Demonstrate an understanding the XML access control and enforcement.

**Course Learning Outcomes (CLO) and Relation to ABET Student Outcomes**

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| **CLOs** | **Outcomes** |
| **A2, A4, A5** | **Knowledge and Understanding**  A2. Know & understand a wide range of principles of Database, Management of database, and Security Architecture models.  A4. Know & understand a wide range of security in database  A5. Know & understand the Operating System Security Fundamentals |
| **B1, B4** | Intellectual Skills  B1. Analyze a wide range of Database Application Security Models  B4. Practice self-learning by using the e-course |
| **C3, C4, C5** | Professional and Practical Skills  Work effectively with and for others.  C4. Strike a balance between self-reliance and seeking help when necessary in new situations  C5. Display personal responsibility by working to multiple deadlines in complex activities. |
| **D2, D4** | General and Transferable Skills  D2. Prepare and deliver coherent and structured verbal and written technical reports.  D4. Use the scientific literature effectively and make discriminating use of Web resources. |

**Learning outcomes achievement**

• Development: A2, A4, and A5 are developed through the lectures.

B1, D5, C3, and C4 have developed through Tutorials, and projects.

B4, D2, D4, D5, and C5 are designed through Homework.

• Assessment: A2, A4, A5, B1, D5, and C4 are assessed through Quizzes, written exams, and Practical Works Exams.

B4, D2, D4, D5, and C5 are assessed through Homework Exams.

**Assessment instruments:**

Evaluation of students’ performance (final grade) will be based on the following three categories:

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| **Allocation of Marks** | |
| **Mark** | Assessment Instruments |
| **30%** | Mid examination |
| **40%** | Final examination |
| **30%** | Quizzes, project, and assignment |
| **100%** | Total |

**Documentation and academic honesty**

* Protection by copyright; avoiding plagiarism.

**Course/module academic calendar**

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| **Course Academic Calendar** | |
| **Week** | **Subject** |
| **1** | **Course Description and Security Architecture** |
| **2** | **Operating System Security Fundamentals** |
| **3** | **Administration of Users Profiles, password policies, privileges, and roles** |
| **4** | **Database Application Security Models** |
| **5** | **Multilevel Secure Relational Model, poly instantiation** |
| **6** | **Access Control Models: MAC, DAC, RBAC** |
| **7** | **Stored Procedures and Functions: PL/SQL I, PL/SQL II**  **Mid Term Exam** |
| **8** | **Virtual Private Databases** |
| **9** | **Database Vault** |
| **10** | **Auditing Database Activities** |
| **11** | **XML Access Control** |
| **12** | **Watermarking in Relational Database** |
| **13** | **Regulations, Compliance and Privacy Protection** |
| **16** | Review  Final Exam |

**[[Expected workload**

On average students need to spend 3 hours of study and preparation for each 50-minute lecture/tutorial.

**Academic Honesty/ student conduct**

As a student at Philadelphia University, you are expected to follow the university regulations and guidelines for academic honesty/student conduct found in student handbook.

This means that you should not cheat, plagiarize and let another student use your account in LMS learning portals.

**Attendance policy**

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and well receive a fail grade for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.