ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΕΙΡΑΙΩΣ
ΤΜΗΜΑ ΠΛΗΡΟΦΟΡΙΚΗΣ

ΠΜΣ ΚΥΒΕΡΝΟΑΣΦΑΛΕΙΑ
ΚΑΙ ΕΠΙΣΤΗΜΗ ΔΕΔΟΜΕΝΩΝ

MSc CYBERSECURITY
AND DATA SCIENCE

DEPT OF INFORMATICS
UNIVERSITY OF PIRAEUS

# Track: Information and Communication Systems Security (ICSS)

1st semester

https://cybersecdatasci.cs.unipi.gr

# Courses



- CDS101: **Network and Communications Security**
- CDS102: **Security Governance**
- CDS103: **Security Architecture Design**
- CDS107: **Data Analytics and Machine Learning**
- CDS113: **Applied Cryptography** (elective course)

# CDS101: Network and Communications Security

- **Syllabus**:
  - Introduction to Network Security
  - Data-link layer security (Ethernet, ARP, WiFi)
  - Network layer security (IP, IPSec)
  - Transport layer security (SSL/TLS)
  - Designing Network Security Policies
  - Cross-layer network security mechanisms (firewalls, Intrusion Detection Systems)
  - Application-layer firewalls and IDS
- **Lab hours**:
  - iptables, snort, ossec, wireshark and nmap, strongswan, openssl
- **Instructors**:
  - Prof. Panayiotis Kotzanikolaou, Prof. Christos Douligeris Cand.PhD Christos Grigoriadis

# CDS102: Security Governance

- **Syllabus**:
  - Risk Assessment Standards
  - Methodologies and Risk Management Tools
  - Security Policies and Procedures
  - Security Auditing and Certification
  - Implementing Legal and Policy Requirements
  - Business Continuity
  - Incident Handling
  - Supply Chain Security
  - Tools for Supply Chain Risk Assessment
- **Lab hours**:
  - CRAMM, eBIOS, MITIGATE
- **Instructors**:
  - Prof. Nineta Polemi, Dr. Spyros Papastergiou, Dr. Iro Chatzopoulou, Ph.Cand. Dimitris Koutras

# CDS103: Security Architecture Design

- **Syllabus**:
  - Introduction to Information Security
  - Identification of security requirements having in mind the business rules and constraints
  - Identification and Design of security services
  - Identification of security mechanisms and platforms (e.g. Multifactor Authentications, Single Sign On, OpenID Connect, Auth2.0, Centralized and Federated Identity Management, Kerberos)
  - Designing security architectures
  - Selection of security controls
- **Lab hours**:
  - Practical exercises from real examples and uses cases in designing secure Information Systems.
- **Instructors**:
  - Prof. Christos Douligeris, Dr. Thanos Karantjias, Dr. Spyros Papastergiou

# CDS113: Applied Cryptography

- **Syllabus**:
  - Symmetric and asymmetric encryption
  - Hash functions
  - Digital signatures
  - Key generation and exchange
  - Homomorphic encryption
  - Cryptographic protocols
  - Secure computations
- **Lab hours**:
  - Hands on exercises and implementation of cryptographic primitives. Detection of implementation issues and their exploitation.
- **Instructors**:
  - Prof. Costas Patsakis, Cand.PhD Dimitris Koutras

# Weekly Planner

week 1: Oct. 11-15, 2021

| Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|
| Week –1 | | | | |
| Welcome, course intro | | | | |
| Weeks 1 to 2 *(elective courses)* | | | | |
| CDS113: **Applied Cryptography** * | | | | |
| Weeks 3 to 12 | | | | |
| CDS102: **Security Governance** | CDS101: **Network and Communications Security** | CDS107: **Data Analytics and Machine Learning** | CDS103: **Security Architecture Design** | *(elective courses)*** |

- * Day by day (5 lectures, in total) – 3 ECTS

-  ** Check detailed program for all elective courses