

IoT Product Cybersecurity and Testing

Course Syllabus

Topic 1: Essential Knowledge of Internet-of-things (3 hours)

- ☐ **Basic IoT Architecture:**
 - ☐ Sensing Layer
 - ☐ Networking Layer
 - ☐ Application Layer
- ☐ **Sensing Layer in IoT:**
 - ☐ Introduction to Sensors
 - ☐ Basic Knowledge of Microcontroller Unit (MCU) in Sensing Layer
 - ☐ Interfaces for Sensors
 - ☐ IoT Communication Module
- ☐ **Networking Layer in IoT:**
 - ☐ Introduction to Radio Middleware
 - ☐ Network Management Platform
 - ☐ Communication in Radio Middleware
- ☐ **Application Layer in IoT:**
 - ☐ Data Exchange Protocols
 - ☐ Access Control
 - ☐ Examples of IoT Applications
- ☐ **IoT Standards:**
 - ☐ IEEE 1451 and IEEE P2668

Topic 2: Fundamentals of Cybersecurity (3 hours)

- ☐ **Cyber Threats**
- ☐ **Security Requirements**
 - ☐ Confidentiality
 - ☐ Integrity
 - ☐ Availability
 - ☐ Privacy
- ☐ **Sensing Layer Security**
 - ☐ Data Accuracy and Calibration
 - ☐ Radio Communication Security
 - ☐ Firmware Security
- ☐ **Networking Layer and Application Layer Security**
 - ☐ Data Exchanging Protocols
 - ☐ Transport Layer Security (TLS)
 - ☐ Access Control Security

Topic 3: Cybersecurity Testing Methods for IoT Products (3 hours)

- ☐ **Vulnerability Assessment**
- ☐ **Product Evaluation**
- ☐ **Risk Analysis**
- ☐ **Introduction of the Key Certifications for IoT Products, including:**
 - ☐ Information Security Management Systems (ISMS) Standards, e.g. ISO 27000-series;
 - ☐ Cryptographic-based Security, e.g. FIPS140-2/ISO 19790;
 - ☐ Automotive Cybersecurity, e.g. ISO/SAE DIS 21434;
 - ☐ Medical Device Cybersecurity, e.g. IEC 62442-4-1/ 4-2, IEC 80001;

Topic 4: Cybersecurity Testing, Practices, and Certification (3 hours)

- ☐ **Cybersecurity Testing and Certification in IoT Industry**
- ☐ **Consumer IoT**
- ☐ **Medical IoT**
- ☐ **Automotive IoT**

Topic 5: Design of EN303645 consumer IoT Cybersecurity Test Plan (3 hours)

- ☐ **Test Plan Design of IoT Cybersecurity Tests according to Product Type and Regulatory Requirements. (e.g. the required test facilities, equipment, test levels)**
- ☐ **Security Profile**
- ☐ **Basic, Substantial, High**
- ☐ **Provisions**
- ☐ **Test Cases Preparation**

Topic 6: Cybersecurity Practices in Laboratory (3 hours)

- ☐ **Introduction of Kali Linux**
- ☐ **Introduction of Firmware analysis**
- ☐ **Extracting firmware from IoT device**
- ☐ **Using online tools to analyse the extracted firmware**