



SPARTA

CYBERSECURITY SKILLS CONFERENCE

ECSF use cases - EU Projects

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CCN PROJECT SPARTA

WP9: CYBERSECURITY TRAINING AND AWARENESS

SPARTA WP9 Overview:

► Deliverables:

- All deliverables (D9.1, D9.2, D9.3, D9.4, D9.5) submitted
- Available: <https://www.sparta.eu/deliverables/>

► Results:

- Education Map published
 - <https://www.sparta.eu/study-programs/>
- Curricula Designer published
 - <https://www.sparta.eu/curricula-designer/>
- Papers published
 - <https://www.sparta.eu/papers/>

► Events:

- Go Cyber with SPARTA at ULPGC
- Go Cyber with SPARTA at La Reunion
- ARES ETACS Workshop
 - 2021, 2022
 - <https://www.ares-conference.eu/workshops-eu-symposium/etacs-2022/>



CCN PROJECT SPARTA CYBERSECURITY CURRICULA DESIGNER 2021

Curricula Designer Web App

- ▶ A result beyond DoA that implements the **SPARTA CSF** and helps building customized curricula.
- ▶ Based on **SPARTA Topics – NICE Competencies – Work Roles** mapping.
- ▶ Allows identification of unsupported “standardized” work roles and **consistent** analysis of existing programs.
- ▶ Currently only for Bachelor’s programs.
- ▶ **Originally based on NICE CSF.**

The screenshot displays the 'Cybersecurity Curricula Designer' web application. It is divided into three main sections: 'Available Courses', 'Your Curricula', and 'Statistics'.

Available Courses: This section lists 'Mandatory Courses' for winter and summer semesters. Courses include: Computers and Programming 1, Data Communication, Foundations of Cryptography, Discrete Mathematics, Mathematics 1, Physics, Multimedia Services, Theoretical Informatics, and Probability and Statistics.

Your Curricula: This section shows a curriculum for a 3-year program. The 1st year includes Communication Technologies and Computers and Programming 2. The 2nd year includes Legal Theory and Mathematics. The 3rd year has drop course options for both semesters.

Statistics: This section provides a summary of the curriculum. It includes a table for 'Total ECTS credits' and a pie chart for 'ECTS by SPARTA areas'.

	winter	summer	sum
1st year	6	5	11
2nd year	7	6	13
3rd year	0	0	0
sum			24

ECTS by SPARTA areas:

Area	Percentage
Computer Science	33.3%
Cryptography	29.2%
Security	25.0%
Mathematics	12.5%
Privacy	0%
Humanistic & Social Sc.	0%
Other	0%

ECTS by SPARTA topics:

Topic	ECTS
Computer Networks	12.5%
Software Engineering	20.8%
Network Security	12.5%
Data Extraction	25%
Law and Regulations	25.2%

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CYBERSECURITY CURRICULA DESIGNER 2021

Weaknesses of 2021 version:

- ▶ Based on SPARTA Cybersecurity Skills Framework (not maintained any more) and NIST NICE (designed in and tailored for US job market):
 - ▶ *sometimes difficult application to EU job market.*
- ▶ No direct link between Work Roles and Knowledge/Skills, need for intermediate connectors (SPARTA Topics):
 - ▶ *may result in losses of precision for Work Roles – KAS mapping.*
- ▶ No support for the newly emerging ECSF designed by ENISA:
 - ▶ *a framework that is expected to become major EU tool would be unsupported.*

Solution provided by 2022 version:

- ▶ Integration of ESCF with Curricula Designer tool.

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ENISA EUROPEAN CYBERSECURITY SKILLS FRAMEWORK

12 Role Profiles in Draft v0.5:

- ▶ Chief Information Security Officer (CISO),
- ▶ Cyber Threat Intelligence Specialist,
- ▶ Cybersecurity Educator,
- ▶ Cybersecurity Risk Manager,
- ▶ Cyber Incident Responder,
- ▶ Cybersecurity Architect,
- ▶ Cybersecurity Implementer,
- ▶ Digital Forensics Investigator,
- ▶ Cyber Legal, Policy & Compliance Officer,
- ▶ Cybersecurity Auditor,
- ▶ Cybersecurity Researcher,
- ▶ Penetration Tester.

For each profile, ECSF defines:

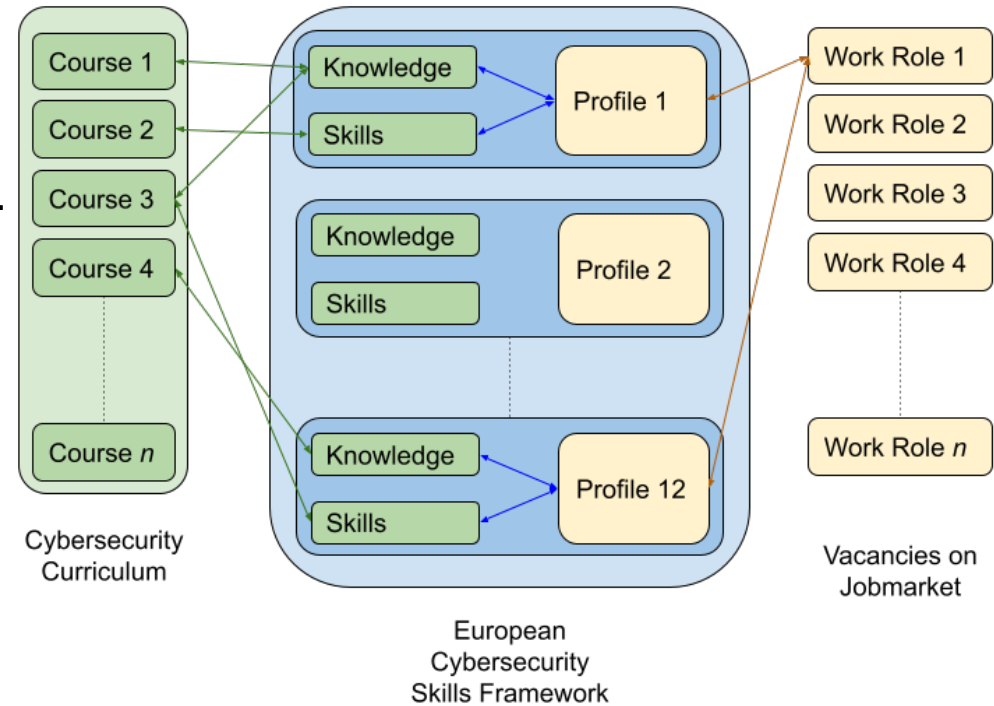
- ▶ Alternative Titles,
 - ▶ Summary Statement,
 - ▶ Mission,
 - ▶ Deliverables,
 - ▶ Main Tasks,
 - ▶ **Key Skills,**
 - ▶ **Key knowledge,**
 - ▶ E-Competences.
-
- ▶ Direct link between Profiles and Skills/Knowledge is defined.



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ESCF AND CURRICULA DESIGNER INTEGRATION

1. For a specific Work Role 1, education providers find the relevant Profiles (Profile 1 and Profile 12 in our example). This mapping, marked by brown arrows, should be specified by the job advertisers/employers.
2. Education providers identify the necessary knowledge and skills for selected profiles. These requirements are defined by the ECSF, marked by blue arrows.
3. Education providers design new or reuse existing courses (in our example courses 1, 2, 3, 4) that address the knowledge and skills identified in the step above. This mapping between courses and their content must be done by course administrators.
4. Having all necessary courses (and all prerequisites for them, general non-cybersecurity courses, other courses for broadening the scope of students, etc.), the core of the curriculum is ready.



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ESCF AND CURRICULA DESIGNER INTEGRATION

Cybersecurity Curricula Designer

Available Courses

Mandatory Courses

- Computers and Programming 1
- Data Communication
- Incidents
- Multimedia Services
- Privacy
- Probability and Statistics
- Testing

Your Curricula

1st year

- Communication Technologies
- Computers and Programming 2

2nd year

3rd year

Statistics

Total ECTS credits:

	winter	summer	sum
1st year	6	5	11
2nd year	13	6	19
3rd year	16	6	22
sum			62

Required Skills:

- Abilities to carry out working-life practices of the data protection and privacy issues involved in the implementation of the organisational processes, finance and business strategy
- Ability to explain and communicate data protection and privacy topics to stakeholders and users
- Ability to lead multidisciplinary cybersecurity teams

Required Knowledge:

- Advanced knowledge of IT/OT, operating systems and computer networks
- Advanced knowledge of National, EU and international cybersecurity and related privacy standards, legislation, policies and regulations
- Advanced knowledge of penetration testing tools, techniques and methodologies

Supported ECSF Profiles:

- Chief Information Security Officer (Ciso)
- Cyber Incident Responder
- Cyber Legal, Policy & Compliance Officer
- Cyber Threat Intelligence Specialist
- Cybersecurity Architect
- Cybersecurity Auditor
- Cybersecurity Educator
- Cybersecurity Implementer
- Cybersecurity Researcher
- Cybersecurity Risk Manager
- Digital Forensics Investigator
- Penetration Tester

Configuration Form:

ID: w_cybersecurity_audit

Name: Cybersecurity Audit

Type: Mandatory Voluntary

Semester: Winter Summer

Credits: 6

Security Management and F: 100%

Save

ECSF Knowledge

- Advanced knowledge of auditing frameworks, standards, methodologies and certifications
- Advanced knowledge of CTI sharing standards
- Advanced knowledge of cybersecurity attack vectors
- Advanced knowledge of cybersecurity awareness, education and training programme development
- Advanced knowledge of cybersecurity solutions
- Advanced knowledge of data privacy and protection laws and regulations
- Advanced knowledge of IT/OT appliances, operating systems and computer networks
- Advanced knowledge of IT/OT operating systems and computer networks

<https://www.sparta.eu/curricula-designer/>

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CYBERSECURITY CURRICULA DESIGNER 2022

Updates of 2022 version:

- ▶ Based on SPARTA Cybersecurity Skills Framework, NIST NICE and ECSF:
 - ▶ *Directly applicable to both US and European job market and institutions.*
- ▶ Direct link between Profiles and Knowledge/Skills
 - ▶ *No losses of precision for Work Roles – KAS mapping.*
- ▶ Support for the ECSF designed by ENISA:
 - ▶ *Curricula Designer is usable in varied environment, framework can be chosen.*

Future work (REWIRE):

- ▶ Simplify the integration of frameworks: definition in machine-readable format.
- ▶ Expand to professional training and certification.
- ▶ Provide more connectors (course databases, study program maps, etc.) and "bilateral features".



THANK YOU FOR WATCHING!

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