

# Curricula Designer Short Manual

## Overview

The Curricula Designer is a web application that allows users to create new or upload existing higher education study programs and analyze their content according to requirements of work roles on a job market. For the analysis, the SPARTA Cybersecurity Skills Framework (CSF) is used. Work Roles and Competencies reflect the requirements of the NIST NICE Framework.

## Using the Tool

The tool is divided into 3 sections, see Figure 1. The left section 1 allows users to define new courses, the middle section 2 allows the composition of a study program from defined courses and the right section 3 provides the statistical data and compliance of the designed program with the requirements.

Cybersecurity Curricula Designer							
Available Courses	Your Curricula 2	Statistics 3					
Add course Sample courses loaded	Computer Science Total ECTS credits:  5.01mm Spreng						
Mandatory Courses	* aditivale cirgineering	winter summer sum					
	winter voluntary course 🖉 🗶	1st year 39 10 49					
winter semester summer semester	Course 2 Humanistic & Social Sc.	2nd year 15 18 33					
winter mandatory course / 1 summer mandatory course / 1	Security Management and Risk Analysis	3rd year 6 6 12					
Mathematics 1 Mathematics		sum 94					
Mathematics Privacy     * Algebra and Discrete Mathematics * Data Extraction	winter mandatory course X						
Topology and Analysis	Privacy Privacy / Humanistic & Social Sc.	ECTS by SPARTA areas:					
summer mandatory course 🖍 🕯	Data Privacy	ECTS by SPARTA areas:					
winter mandatory course /  Physics Probability and Statistics Mathematics	Human Aspects of Security and Privacy	Computer Science					
Probability and Statistics Mathematics Mathematics * Topology and Analysis		23.4% Cryptology					
Probability and Statistics		36.2% Security					
summer mandatory course 🖌 🗈	2nd year	Mathematics					
Theoretical Informatics	· · ·	Privacy     Privacy     Humanistic & Social Sc.					
Computer Science * Theoretical Computer Science	winter semester summer semester	2 <sup>22</sup> AV 24.5% Other					
	winter mandatory course 🛛 🗙 summer mandatory course 🗸 🗙	<b>A A A A A A A A A A</b>					
	Foundations of Cryptography Data Communication						
	Cryptology     Computer Science     Fundamental Cryptology     * Communication Theory						
Voluntary Courses	• Communication medicing	ECTS by SPARTA topics:					
winter semester summer semester	winter voluntary course 🛛 🗙 summer mandatory course 🗸 🗙	Topic ECTS					
	Course 1 Discrete Mathematics	Computer Systems 5.9%					
	Humanistic & Social Sc. Mathematics + Law and Regulations + Algebra and Discrete Mathematics	Computer Systems 64%					
	Sum and regarizons     Number Theory	Computer Networks 3.2%					
		Software Engineering 8%					
	summer voluntary course	Fundamental Cryptology 6.4%					
	Course 4 Humanistic & Social Sc.	Hardware and Software Security 5.3%					
	Security Architecture	Network Security 6.4%					
		System Security 6.4%					
		Incident Response 6.4%					
		Algebra and Discrete Mathematics 3.2%					
3rd year		Number Theory 3.2%					
winter semester summer seme		Data Privacy 3.2%					
	winter mandatory course	Human Aspects of Security and Privacy 3.2%					
	Multimedia Services Incidents	Security Architecture 8.4%					
	Computer Science / Security Security	Law and Regulations 17%					
	Computer Systems     Network Security	Security Management and Risk Analysis 9.6%					

Figure 1: Designer GUI.



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## Adding Courses

The left section 1 allows users either to load sample courses from a good-practice curriculum (button "Load sample courses") or define own courses using the button "Add course". When adding courses (see Fig. 2), users must fill in data about the course, i.e. the name, type, semester, whether it includes a practical training, number of ECTS credits and Topics, that the course covers. For а detailed description of SPARTA Topics, see D9.2 (https://www.sparta.eu/assets/deliverables/SPARTA-D9.2-Curricula-descriptions-PU-M18.pdf).

	Computer Science • Computer Systems			
		×		1st year
	Course 2 Humanistic & Social Sc.			2nd year 3rd year
ũ	Security Management and Risk Analysis			Sid year
	Add new course			×
ō	ID			
	Name			3.2
ō	Туре	Mandatory	O Voluntary	
	Semester	○ Winter	Summer	3
	Training	◯ Yes	◯ No	
	ECTS Credits	٢		
	Topics (ECTS %)	\$		
				_
				_
			Clo	se Save
		Humanistic & Social Sc.		ardware and Software Se
			N	letwork Security

Figure 2: Adding courses.

## **Composing Programs**

When courses are added, the study program may be composed by simply dragging the course box into the middle section, to the area representing a particular semester (summer/winter, year 1,2, 3). The app automatically checks the semester and does not allow insertion into a wrong semester. The final program can be exported to a json format for a future work. *Be careful, reloading page causes loss of all courses and program, unless saved using the export button!* 

## **Reading Analytical Data**

In the right section 3 (see Fig. 3), statistical information about the study program is displayed. This information includes distribution of credits in semesters, distribution of ECTS credits to SPARTA Areas and SPARTA Topics, supported NIST NICE Competencies, and, most importantly, NIST NICE Work Roles supported by the study program. The Work Role is considered supported if required competence is covered in at least one subject. You can display the necessary Competencies of a particular Work Role by hovering with your mouse over the Work Role. The information is dynamically updated as the study program is being created.



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Figure 3: Program analysis – supported Work Roles.

## **Contact Information**

The tool was designed and implemented within the SPARTA project (<u>https://www.sparta.eu</u>). Currently, the app is maintained by the Brno University of Technology. For more information, please contact *crypto@feec.vutbr.cz*.



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