



Co-funded by the  
Erasmus+ Programme  
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ISSES – Information Security Services  
Education in Serbia

Supported by the Erasmus+ Capacity Building in the  
field of Higher Education (CBHE) grant  
N° 586474-EPP-1-2017-1-RS-EPPKA2-CBHE-JP

# INFORMATION SECURITY SERVICES EDUCATION IN SERBIA (ISSES)

*Erasmus+ Key Action 2 – Capacity Building in  
the field of Higher Education (CBHE)*

*Coordinated by the University of Novi Sad  
2017 – 2020*

# Presentation at a glance...

- Introduction
- Existing courses
- Work packages
- Curriculum development
- Laboratory development
- Supporting work packages



# Vision – University of Novi Sad

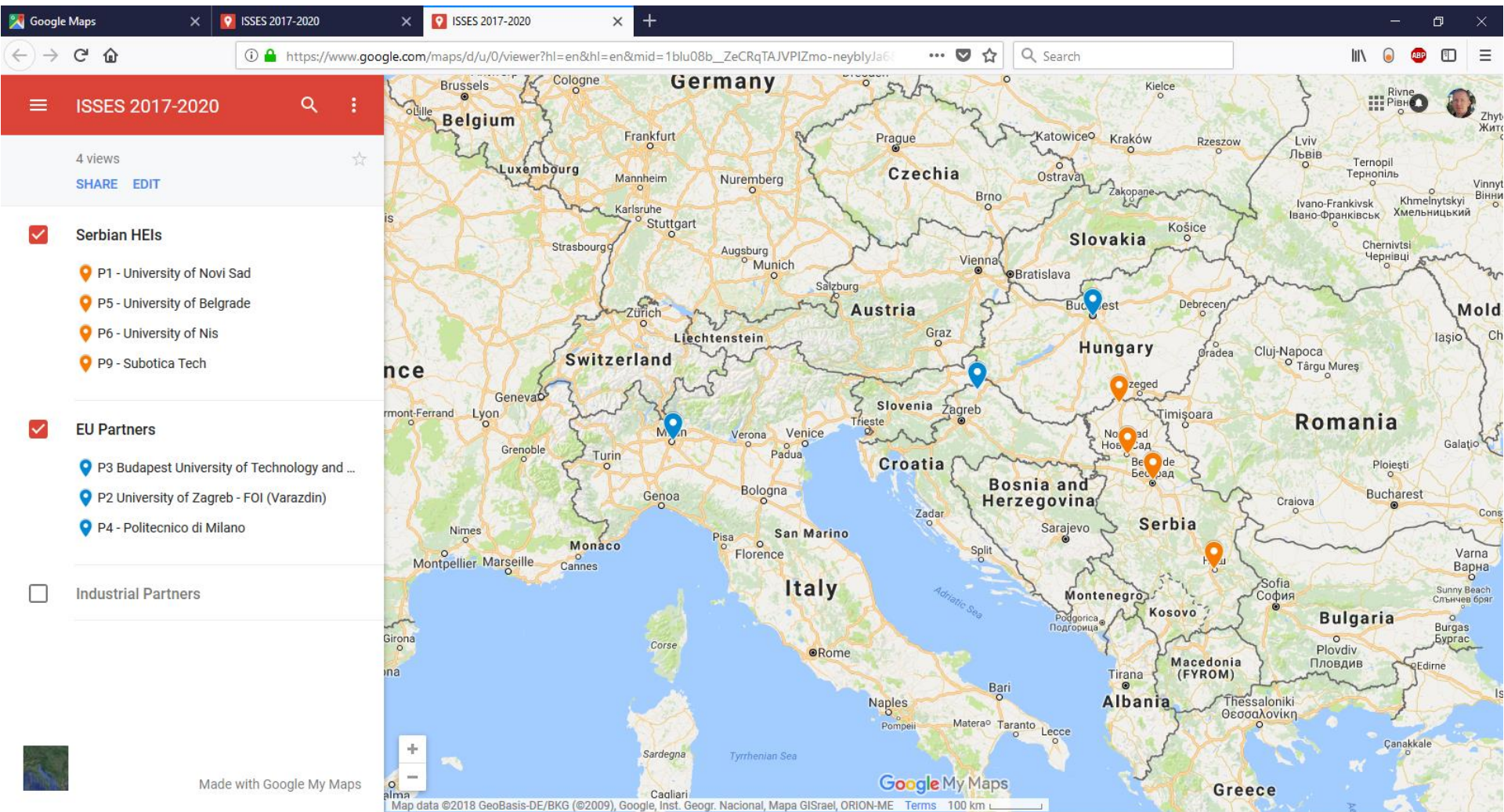


- Develop an MSc program specializing in critical infrastructure security
- Draft list of courses:
  - Advanced Network Security
  - Advanced Cryptography
  - Secure Software Development
  - Security Data Science
  - Critical Infrastructure Security

# Project Overview

- **Goals:** Improve Information Security Education & Train new experts in Serbia
  - Novi Sad: MSc in Critical Infrastructure Security
  - Belgrade: MSc in Digital Forensics
  - Subotica: Specialization in Cloud and IoT Security
- **Project Budget:** ~800,000 EUR
- **Project Duration:** October 2017 – October 2020
  - Enroll MSc students as soon as 2019
- **Coordinator:** University of Novi Sad (Imre Lendak)
- **Foreign Partners:**
  - CrySys Lab, Budapest, Hungary
  - FOI, Varaždin, Croatia
  - Polimi, Milano, Italy
- **Industrial Partners:**
  - Schneider Electric DMS, Serbia
  - Unicom-Telecom, Serbia
  - Innovation Center Of The University In Niš, Serbia
- **Serbian Universities/Colleges:**
  - University of Belgrade (ETF & FON)
  - University of Novi Sad
  - University of Nis
  - Subotica Tech

# Geographic coverage



# Associated partners



PID	Name	City	PIC
P11	M&I Systems	Novi Sad	919199064
P12	Singi Engineering Ltd	Belgrade	914898957
P13	Evopro System Engineering	Budapest	996332785
P14	NetVisor	Budapest	989553746
P15	Advanced Security Technologies	Nis	920915576
P16	TIAC Ltd	Novi Sad	936625308
P17	Eccentrix Ltd	Belgrade	
P18	Verisec Labs d.o.o.	Belgrade	
P19	Cisco Serbia Ltd	Belgrade	915360677
	Microsoft Development Center Serbia	Belgrade	(almost)

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# **EXISTING COURSES @ UNS/FTN**



# “Smart Grid Security”



Course title (in English)	Security and Safety in Electric Power Systems
Course title (in Serbian)	Sigurnost i bezbednost u elektroenergetskim sistemima
BSc/MSc/PhD/Spec level of studies	BSc – 7 <sup>th</sup> semester – 3+1 week block, project-based Accredited on the MSc level under a different name, but inactive in school year 2017/2018
ECTS credit points	4
Higher education institution (HEI)	FTN – UNS
City	Novi Sad
Information security domains and concepts (5-15 elements covered by the lectures and laboratory exercises)	Introduction; Personnel & Physical Security; Cryptography overview; Secure communication channels (i.e. Network Security); AAA; Malware; Secure Software Development; Privacy and Legal aspects; Information Security Policy; Organizations & Standards;
Professor(s) – name, title, organization, email	Imre Lendak, assistant professor, FTN – UNS <a href="mailto:lendak@uns.ac.rs">lendak@uns.ac.rs</a>



# e-Business Security



Course title (in English)	E-Business Systems Security
Course title (in Serbian)	Bezbednost u sistemima elektronskog poslovanja
BSc/MSc/PhD/Spec level of studies	BSc
ECTS credit points	4
Higher education institution (HEI)	FTN - UNS
City	Novi Sad
Information security domains and concepts (5-15 elements covered by the lectures and laboratory exercises)	cryptography; PKI infrastructure; XML and web services security; smart card technology; application of security concepts at the level of operating systems, databases, and computer networks; authentication; access control; threat modeling
Professor(s) – name, title, organization, email	Goran Sladić, associate professor, FTN – UNS, <a href="mailto:sladicg@uns.ac.rs">sladicg@uns.ac.rs</a>

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# WORK PACKAGES

# Work Packages

ID	Phase	Description
WP1	Preparation	Project Design
WP2	Development	Curriculum Development
WP3	Development	Laboratory Development
WP4	Development	Education Programme Development
WP5	Quality Plan	
WP6	Dissemination & Exploitation	
WP7	Management	

# WP1 – Project Design (UNS)



- Period: M1 – M6 (October 15<sup>th</sup>, 2017 – April 14<sup>th</sup>, 2018)
- Key outputs:

ID	Title	Institution
1.1	Baseline Curricula Report	UB, UNS, UNI, VTS, others
1.2	Repository of Information Security Concepts	UNS
1.3	Course Development Plan (CDP)	UB
1.4	Laboratory Development Plan (LDP)	UNI

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# CURRICULUM DEVELOPMENT

# WP2 – Curriculum Development (UNS)



ID	Title	Institution ?	
2.1	Critical Infrastructure Security	BME, Polimi, UNS	M13-M21
2.2	Secure Software Development	BME, UNS, UNI	M6-M12
2.3	Cloud Security	UNI, UNS	M24-M32
2.4	Security and privacy in the Internet of Things	FOI, Polimi, BME, VTS	M16-M24
2.5	Advanced Cryptography	BME, UNS, UNI	M16-M24
2.6	Advanced Network Security	Polimi, UB/ETF	M7-M15
2.7	Cyber Security Strategies	BME, UB/FON	M7-M15
2.8	Security in E-business Systems	Polimi, UNS	M18-M28
2.9	Risk Analysis and Threat Modelling	Polimi, UNS	M25-M33
2.10	Cyber Incident Analysis and Response	FOI, UB/FON, UNS	M9-M17
2.11	Data Mining in Digital Forensics	FOI, Polimi, UB/FON, UNS	M17-M24
2.12	Digital Forensics Tools and Techniques	FOI, UB/FON, UNI, UNS	M13-M21
2.13	Mobile and Multimedia Forensics	FOI, UB/FON	M22-M30

# WP2 – Work Phases

- **Phase I:** Introductory trainings will be carried out by P2, P3 and P4 during the preparation phase at the kick-off and Steering Committee meetings.
- **Phase II:** More detailed trainings will be organized at the EU HEIs for the representatives of the Serbian HEIs. Teachers and researchers will analyze the course content and delivery methods (e.g. attend lectures) while onsite.
- **Phase III:** The Serbian HEIs will work on course content at home, carefully aligning all content with the RISC (output 1.2), thereby allowing smooth projects progress and quality monitoring.
- **Phase IV:** Additional onsite training and tuning of course content at the EU HEIs.
- **Phase V:** Sharing the completed course content with the other Serbian HEI partners.
- **Phase VI:** Translation of teaching materials (Power Point presentations) as the new courses will be prepared in Serbian, and they will be translated to English, as they will be accredited in both Serbian and English.



# WP2 – Outputs



- Course Development Plan (M5)
  - *The CDP will be written in English and published as a PDF document of 15 pages.*
- Course-specific outputs
  - *Course content will be documented with teaching materials (e.g. Power Point presentation) and a textbook.*
  - Will it be necessary to modify this?
  - Any existing plans for books?
- Shared materials between the institutions
  - Used by Serbian HEIs
  - Used by BME, FOI & Polimi as well

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# LABORATORY DEVELOPMENT

# WP3 – Laboratory Development (BME)



ID	Title	Institution	
3.1	Lab Design: Critical Infrastructure Security Laboratory (CIS Lab)	BME/Polimi	M13
3.2	Lab Design: Digital Forensics Laboratory (DF Lab)	FOI	M13
3.3	Lab Design: Network Security Laboratory (NS Lab)	BME, Polimi	M13
3.4	Lab Design: Cloud Security Laboratory (CS Lab)	?	M14
3.5	Hybrid CIS, CS and NS Lab implementation (P1)	UNS, BME, Polimi	M14-M24
3.6	Hybrid NS and Crypto Lab Implementation (P5)	UB, ETF, BME	M14-M21
3.7	NS Lab implementation (P6)	UNI, Polimi	M18-M24
3.8	DF Lab Implementation (P5)	UB, FON	M13-M24
3.9	DF Lab Implementation (P6)	UNI, FON	M25-M30
3.10	DF Lab Implementation (P1)	UNS, FON	M31-M36
3.11	Hybrid CS and IoT Lab Implementation (P9)	VTs, BME, FOI	M15-M24

# WP3 – Work Phases



- **Phase I:** Introductory trainings and knowledge transfer from P2, P3 and P4.  
**Phase II:** Onsite knowledge transfer about laboratory designs at partners P2, P3 and P4.
- **Phase III:** Create Laboratory Development Plan with details about timing, trainings and other necessary inputs.
- **Phase IV:** Create four typical laboratory designs and align them with the RISC (output 1.2), thereby allowing smooth lab development progress and quality monitoring. The plans will be revised by EU-based partners P2, P3 and P4.
- **Phase V:** Build 7 laboratories at the four Serbian HEIs
- **Phase VI:** Utilize the laboratories in teaching activities performed in either the new education programs or the newly developed courses.

# WP3 Outputs



- Laboratory Development Plan (LDP) in WP1
  - *The LDP will be written in English and published as a PDF document of 15 pages.*
- Minimum set of elements of laboratory designs
- Measuring lab implementation status – based on the RISC (output 1.2)
  
- Additional questions:
  - Will we be ready to do public procurement in November 2018?
  - Is it too late to have the hardware and software in 2019/Q3?

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# **SUPPORTING WORK PACKAGES**

## WP4 – Program Development (UBG)



- Introduce new MSc programs in information security at 3 out of 4 Serbian HEIs involved
- With the support of ISSES, VTS will introduce its 1<sup>st</sup> MSc program

ID	Title	Institution
4.1	MSc Program: Information Security in Critical Infrastructures	UNS
4.2	MSc Program: Information Security and Digital Forensics	UB/FON
4.3	MSc Program: Security in the Cloud and Internet of Things	VTS



# WP5 – Quality Plan (Polimi)

- Necessary element in each Erasmus+ capacity building project
  - Internal and external quality monitoring throughout the project lifetime
- Tied with the Repository of Information Security Concepts (RISC) developed in WP1 Preparation

ID	Title	Institution
5.1	Quality Plan	Polimi
5.2	Annual Course Quality Report	Polimi
5.3	Annual Laboratory Build Report	BME
5.4	Quality Board Meeting	
5.5	External Quality Assessment	Polimi

## WP6 – Dissemination & Exploitation (UBG)

ID	Title	Institution
6.1	Dissemination Plan (DP)	UB/ETF
6.2	Exploitation Plan (EP)	UB/ETF
6.3	Annual Project Workshop	UB/ETF
6.4	Mass Media Dissemination	UB/ETF & UNS
6.5	Security Services Roundtable	UB, UNS, UNI, VTS
6.6	Web portal setup and maintenance	UB/ETF

## WP7 – Project Management (UNS)

ID	Title	Institution
7.1	Brussels Kick-of Meeting – January 29-30, 2018	UNS
7.2	Project Kick-off Meeting – December 13-14, 2017	UNS
7.3	Project Steering Committee Meeting	
7.4	Project Coordination	UNS
7.5	Financial Plan	UNS
7.6	Interim and Final Report	UNS

# Summary

- Introduction
- Existing courses
- Work packages
- Curriculum development
- Laboratory development
- Supporting work packages





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**Thank you for your attention!**