SYLLABUS

1. Data about the program of study

1.1 Institution	The Technical University of Cluj-Napoca
1.2 Faculty	Faculty of Automation and Computer Science
1.3 Department	Computer Science
1.4 Field of study	Computer Science and Information Technology
1.5 Cycle of study	Master of Science
1.6 Program of study / Qualification	Data Science / Master
1.7 Form of education	Full time
1.8 Subject code	17.20

2. Data about the subject

2.1 Subject name	*Information Security*				
2.2 Course responsible / lecturer	Assoc. prof. dr. eng. Adrian Coleşa - Adrian.Colesa@cs.utcluj.ro Assoc. prof. dr. eng. Ciprian Oprişa - Ciprian.Oprisa@cs.utcluj.ro				
2.3 Teacher in charge of seminars / laboratory / project	Assoc. prof. dr. eng. Adrian Coleşa - Adrian.Colesa@cs.utcluj.ro Assoc. prof. dr. eng. Ciprian Oprişa - Ciprian.Oprisa@cs.utcluj.ro				
2.4 Year of study	II	2.5 Semester	3	2.6 Type of assessment *(E - exam, C - colloquium, V - verification)*	E
2.7 Subject category	*DA – de aprofundare, DS – de sinteza, DC – complementară*				DC
	DI – Impusă, DOp – opțională, DFac – facultativă				DOp

3. Estimated total time

3.1 Number of hours per week	1	of which:	Course	1	Seminars	-	Laboratory	-	Project	1
3.2 Number of hours per semester	28	of which:	Course	14	Seminars	-	Laboratory	-	Project	14

3.3 Individual study:	
(a) Manual, lecture material and notes, bibliography	25
(b) Supplementary study in the library, online and in the field	13
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays	25
(d) Tutoring	4
(e) Exams and tests	5
(f) Other activities:	0

3.4 Total hours of individual study (sum (3.3(a)...3.3(f)))	72
3.5 Total hours per semester (3.2+3.4)	100
3.6 Number of credit points	4

4. Pre-requisites (where appropriate)

4.1 Curriculum	N/A
4.2 Competence	Basic knowledge of operating systems and computer networks

5. Requirements (where appropriate)

5.1. For the course	Blackboard, projector, computer
5.2. For the project	Specific equipment and software for the project topic

6. Specific competence

6.1 Professional competences	**C1** - Working with advanced mathematical methods and models, engineering and computing specific techniques and technologies. • **C1.1** – Knowledge of the main cybersecurity risks and threats, focusing on those applicable to data security. • **C1.2** – Modeling new security risks and assessing their impact on companies and private persons data. • **C1.3** – Data encryption and anonymization according to good practice principles and current legislation. **C4** - Contextual integration and exploitation of dedicated information systems. • **C4.1** – Applying security techniques for data transimission and storage. • **C4.2** – Propsing security solutions and intrusion detection methods based on data analysis.
6.2 Cross competences	**CT3** - Exercising the skill of continuous self-education and demonstrating critical, innovative and research abilities.

7. Discipline objective

7.1 General objective	Getting familiar with security concepts specific to data science and acquiring a vision and skill set where security is a key element in data analysis and manipultation.
7.2 Specific objectives	• Knowledge of the common cybersecurity attacks and the techniques to defend from them. • Getting familiar with basic cryptography concepts, both theoretically and applied on existing communication protocols. • Approaching data processing problems by considering the privacy issues and protecting personal identifible information. • Approaching security problems with a data-oriented perspective.

8. Contents

8.1 Lectures	Hours	Teaching methods	Notes
Basic cybersecurity concepts and discussing the main attack types	2	Discussion and multimedia materials Interractive teaching style Involving students in presenting some case studies.Problems solving	N/A
Cybersecurity elements	2		
Secure communication protocols	2		
Privacy enforcement and GDPR	2		
Data anonymization techniques	2		
Security threats detection through data analysis	2		
Recap	2		

Bibliography:
1. Whitman, Michael E., and Herbert J. Mattord. *Principles of information security*. Cengage learning, 2021.
2. Jarmul, Katharine. *Practical Data Privacy*. O'Reilly, 2023
3. Sikos, Leslie F., and Kim-Kwang Raymond Choo, eds. *Data science in cybersecurity and cyberthreat intelligence*. Cham: Springer, 2020.

8.2 Applications (seminars/laboratory/project)*	Hours	Teaching methods	Notes
Introduction	2	Discussion and multimedia materials Study of relvant research papers Applying the studied techniques	N/A
Bibliographic research: resources identification	2		
Bibliographic research: documentation analysis and synthesis	2		
Requirements gathering	2		
Implementing and testing a case study	2		
Analysis of the experimental results	2		
Redacting and presenting the final document	2		

Bibliography:
1. Whitman, Michael E., and Herbert J. Mattord. *Principles of information security*. Cengage learning, 2021.
2. Jarmul, Katharine. *Practical Data Privacy*. O'Reilly, 2023
3. Sikos, Leslie F., and Kim-Kwang Raymond Choo, eds. *Data science in cybersecurity and cyberthreat intelligence*. Cham: Springer, 2020.

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	Theoretical analysis and problem solving skills based on the acquired knowledge	Written exam	60%
Project	Based on the obtained results and the analysis and synthesis skills	Oral evaluation	40%

Minimum standard of performance:
- Proving the grasp on information security concepts
- The skill to study and synthesize a relevant research paper.
- Final grade computation: 40% project + 60% final exam
- Pass criteria: Final exam ≥ 5; Project evaluation ≥ 5

Date of filling in: 26.02.2026	Responsible	Title First name Last name	Signature
	Course	Assoc. prof. dr. eng. Ciprian OPRIȘA	
		Assoc. prof. dr. eng. Adrian COLEȘA	
	Applications	Assoc. prof. dr. eng. Ciprian OPRIȘA	
		Assoc. prof. dr. eng. Adrian COLEȘA	

Date of approval in the department
17.09.2025

Head of department,
Prof.dr.eng. Rodica Potolea

Date of approval in the Faculty Council
19.09.2025

Dean,
Prof.dr.eng. Vlad Mureșan