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	Masters
1.6 Program of study / Qualification	Data Science / Masters
1.7 Form of education	Full time

2. Data about the subject

2.1 Subject name	***Information Security***			Subject code	**17.2**
2.2 Course responsible / lecturer	Assoc. prof. dr. eng. Coleșa Adrian - Adrian.Colesa@cs.utcluj.ro Assoc. prof. dr. eng. Oprișa Ciprian - Ciprian.Oprisa@cs.utcluj.ro				
2.3 Teachers in charge of seminars / Laboratory / project	Assoc. prof. dr. eng. Coleșa Adrian - Adrian.Colesa@cs.utcluj.ro Assoc. prof. dr. eng. Oprișa Ciprian - 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	Formative category: DF – fundamental, DS – speciality, DC – complementary				DC
	Optionality: DOB – mandatory, DOP – optional (alternative), DFA – optional (free choice)				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:										-

3.4 Total hours of individual study (suma (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 applications	Specific equipment and software for the project topic

6. Specific competence

6.1 Professional competences	• analyse big data • analyse business processes • analyse decentralised applications • build predictive models • create data models • debug software • define software architecture • define technical requirements • design cloud architecture • design process for blockchain-based systems • develop blockchain innovative architectures • develop software prototype • develop with cloud services • evaluate blockchain architectures • explain blockchain implications • explain distributed ledger technologies principles • identify blockchain innovation opportunities • implement smart contracts • interpret technical requirements • manage cloud data and storage • outline blockchain-based identity management • oversee development of software • perform data cleansing • perform data mining • perform scientific research • provide technical documentation • recognise blockchain application areas • recognise blockchain risks • use data processing techniques • use software design patterns • use software libraries • utilise computer-aided software engineering tools • utilise machine learning
6.2 Cross competences	The graduate: • develop an analytical approach • taking a proactive approach • developing strategies to solve problems • being open minded • coordinate engineering teams

7. Expected Learning Outcomes

Knowledge	The student has knowledge of: • distributed ledger technology vulnerabilities • blockchain application security principles • digital identity management • cryptocurrency
Skills	The student is able to: • create data sets • manage data • analyse pipeline database information • explain blockchain implications

Responsibilities and autonomy	The student has the ability to work independently in order to: • develop an analytical approach • take a proactive approach • develop strategies to solve problems • be open minded

8. Discipline objective (as results from the *key competences gained*)

8.1 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.
8.2 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 identifiable information. • Approaching security problems with a data-oriented perspective.

9. Contents

9.1 Lectures	Hours	Teaching methods	Notes
Basic cybersecurity concepts and discussing the main attack types	2		
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.

9.2 Applications - Seminars/Laboratory/Project	Hours	Teaching methods	Notes
Introduction	2		
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.

**Se vor preciza, după caz: tematica seminariilor, lucrările de laborator, tematica și etapele proiectului.*

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

11. 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%
Seminar	-	-	-
Laboratory	-	-	-
Project	Based on the obtained results and the analysis and synthesis skills	Oral evaluation	40%
Minimum standard of performance:			

Date of filling in: 29.04.2026	**Responsible**	**Title First name Last name**	**Signature**
	Course	Assoc. prof. dr. eng. Adrian COLEȘA	
		Assoc. prof. dr. eng. Ciprian OPRIȘA	
	Applications	Assoc. prof. dr. eng. Adrian COLEȘA	
		Assoc. prof. dr. eng. Ciprian OPRIȘA	

Date of approval in the department	Head of department, Prof.dr.eng. Rodica Potolea
Date of approval in the Faculty Council	Dean, Prof.dr.eng. Vlad Mureșan