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 / Master
1.7 Form of education	Full time

2. Data about the subject

2.1 Subject name	***Research Practice***			Subject code	**20**
2.2 Course responsible / lecturer	Not necessary				
2.3 Teachers in charge of seminars / Laboratory / project	Not necessary				
2.4 Year of study	II	2.5 Semester	4	2.6 Type of assessment (E - exam, C - colloquium, V – verification)	V
2.7 Subject category	Formative category: DF – fundamental, DS – speciality, DC – complementary				DS
	Optionality: DOB – mandatory, DOP – optional (alternative), DFA – optional (free choice)				DOB

3. Estimated total time

3.1 Number of hours per week	14	of which:	Course	-	Seminars	-	Laboratory	-	Project	14
3.2 Number of hours per semester	196	of which:	Course	-	Seminars	-	Laboratory	-	Project	196
3.3 Individual study:										
(a) Manual, lecture material and notes, bibliography										-
(b) Supplementary study in the library, online and in the field										25
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays										25
(d) Tutoring										-
(e) Exams and tests										4
(f) Other activities:										-

3.4 Total hours of individual study (suma (3.3(a)…3.3(f)))	54
3.5 Total hours per semester (3.2+3.4)	250
3.6 Number of credit points	10

4. Pre-requisites (where appropriate)

4.1 Curriculum	Research Activity 1, 2 and 3
4.2 Competence	Related to the discipline above

5. Requirements (where appropriate)

5.1. For the course	It's not necessary
5.2. For the applications	Computers, equipment and specific software

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: • cloud technologies • computer science • data warehouse • statistics • blockchain application security principles • blockchain architecture • blockchain-based business models
Skills	The student is able to: • manage data • manage research data • process data • store digital data and systems
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	Development of research and design skills and competencies in the field of intelligence and artificial vision, computers and information technology
8.2 Specific objectives	Assimilation of knowledge and skills regarding: • integration of the components of the completed application system • testing and validating the completed application • development of product documentation • development of the user manual • elaboration of a scientific presentation

9. Contents

9.1 Lectures	Hours	Teaching methods	Notes
Not necessary			
Bibliography: Not necessary			
9.2 Applications - Seminars/Laboratory/Project	Hours	Teaching methods	Notes
Realization of at least one validation of the obtained results		Individual work and periodic checks.	
Elaboration of conclusions resulting from a research activity			
Evidence of personal contributions obtained as a result of a research activity;			
Evidencing the possibilities of continuing research through a doctorate			
Documentation on the dissertation topic;			
Creation of a report summarizing the activities carried out.			
Bibliography: Establishd by each advisor in accordance with the research topics			

**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

It is carried out through periodic meetings with representatives of the economic environment.

11. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	Not necessary	-	-
Seminar	-	-	-
Laboratory	-	-	-
Project	Based on the practical results and the elaborated report	Oral examination, Report evaluation	60% 40%
Minimum standard of performance: Average 5			

Date of filling in: 29.04.2026	**Responsible**	**Title First name Last name**	**Signature**
	Course	-	
	Applications		

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