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	Automation
1.4 Field of study	Systems Engineering
1.5 Cycle of study	Bachelor of Science
1.6 Program of study/Qualification	Automation and Applied Informatics, English
1.7 Form of education	Full time
1.8 Subject code	26.00

2. Data about the subject

2.1 Subject name	**Software Engineering**			
2.2 Course responsible/lecturer	S.l.dr.ing.Radu-Florin Miron: Radu.Miron@aut.utcluj.ro;			
2.3 Teachers in charge of seminars	S.l.dr.ing. Radu-Florin Miron: Radu.Miron@aut.utcluj.ro; S.l.dr.ing. Octavian Cuibus: Octavian.Cuibus@aut.utcluj.ro Asist.dr.ing. Dahlia Al-Janabi: Dahlia.Aljanabi@aut.utcluj.ro			
2.4 Year of study	2	2.5 Semester	2	2.6 Assessment (E – exam, C – colloquy, V – verification)	E
2.7 Subject category	DF – fundamental, DD – în the field, DS – specialization, DC – complementary			DD
	DI – imposed, DO – opțional, DFac – facultative			DI

3. Estimated total time

3.1 Number of hours per week	4	of which:	Course	2	Seminars		Applications	2	Project	
3.2 Number of hours per semester	125	of which:	Course	28	Seminars		Applications	28	Project	

3.3 Distribution of the time fund (hours per semester) for:	
a) Individual study	16
b) Manual, lecture material and notes, bibliography	10
c) Supplementary study in the library, online and in the field	30
d) Preparation for seminars/laboratory works, homework, reports, portfolios, essays	10
e) Tutoring	3
f) Exams and tests	

3.4 Total hours of individual study	69	
3.5 Total hours per semester	125	
3.6 Number of credit points	5	

4. Pre-requisites (where appropriate)

4.1 Curriculum	Logic design, Computer architectures Computer programming
4.2 Competence	Basic knowledge from mathematics, physics, mechanical engineering, electric and electronics engineering used in system engineering.

5. Requirements (where appropriate)

5.1. For the course	N/A
5.2. For the applications	the attendance is compulsory

6. Specific competences

6.1 Competenţe profesionale	C2 Operating with fundamental concepts in computer science, information technology, and communications. C2.2 The reasoned use of concepts from computer science and computer technology in solving well-defined problems in systems engineering and in applications that require the use of hardware and software in industrial

	systems or in computer systems.
6.2 Competenţe transversale	
	N/A

7. Obiectivele disciplinei

7.1 General objectives	• object-oriented programming, • designing control applications using the Unified Modeling Language (UML), • implementing software projects
7.2 Specific objectives	• the reasoned use of concepts from computer science and computer technology in solving well-defined problems in systems engineering and in applications that require the use of hardware and software in industrial systems or in computer systems • designing control applications using methods from software engineering

8. Conţinuturi

8.1 Lecture (syllabus)	Nr.ore	Teaching methods	Notes
1. Introduction to software engineering	2		
2. Introduction to Java language	2		
3. Programming Basic Elements	2		
4. Object Oriented Programming	2		
5. Object management	2		
6. Input/output Programming for control applications	2		
7. Graphical interface programming for control applications	2	Multimedia, interactive	
8. Multithreading programming of control applications	2		
9. Design of control applications using Unified Modeling Language (UML)	2		
10. Specification of control applications using UML	2		
11. UML design diagrams for control applications	2		
12. Implementation of UML design diagrams	2		
13. Examples of control application design	2		
14. Examples of control application implementation	2		

Bibliography
1. T. Leţia. *Programarea avansată în Java*. Editura Albastră (Microinformatica), 2002.
2. K. Sierra, B. Bates, *Head First Java*, *3rd Edition*, O'Reilly Media, Inc, USA, 2022
3. OMG – Unified Modeling Language Specification.
4. R.G. Urma, M. Fusco, A. Mycroft, *Modern Java in Action*, Manning Publications, 2018.
5. B. Eckel. *Thinking in Java. Second edition*. Pearson Education, 2006.
6. https://docs.oracle.com/javase/tutorial/

8.2 Aplicații (seminar/laborator/proiect)*	Nr.ore	Theaching methods	Notes
1. Introduction to Java environment tools and IDE	2		
2. Applications with classes and objects	2		
3. Object management applications	2		
4. Exception handling and string applications	2		
5. Thread construction.	2		
6. Concurrent programming applications	2		
7. Graphic interfaces	2	Multimedia, interactive	
8. Class and object diagram implementation	2		
9. UML. Control application specification	2		
10. Sequence diagram implementation	2		
11. State diagram construction and implementation	2		
12. Activity diagram construction and implementation	2		
13. Compensatory	2		
14. Final test	2		
Bibliography			

1. http://radumiron.net
2. https://github.com/isp-cluj

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

The courses subjects cover the requirements of the IT employers, mainly those in the field of software engineering.

The laboratories are inspired from real life applications developed by IT companies from Cluj.

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	exam (E)	Written test	0.5
Seminars			
Laboratories	tests (C)	Knowledge assessment, problem solving, written tests.	0.5
Project			
Minimum standard of performance: E≥5; C≥5			

Date of filling in: 02.04.2023	Titulari	Title Firstname NAME	Signature
	Course	S.L. Dr. Ing. Radu Miron	
	Applications	S.L Dr. Ing. Radu Miron	
		S.L. Dr. Ing. Octavian Cuibus	
		Asist. Dr. Ing. Dahlia.Aljanabi@aut.utcluj.ro	

Date of approval by the Department Board   Head of Departament

_____   Prof.dr.ing. Honriu Valean

Date of approval by the Faculty Council   Dean

_____   Prof.dr.ing. Liviu Miclea