SYLLABUS

INTERNSHIP ÎN SPECIALIZARE

University year 2025/2026

1. Information regarding the programme

1.1. Higher education institution	*Babeş-Bolyai University*
1.2. Faculty	*Mathematics and Computer Science*
1.3. Department	*Computer Science*
1.4. Field of study	*Computer Science*
1.5. Study cycle	*Master*
1.6. Study programme/Qualification	*Applied Computational Intelligence*
1.7. Form of education	*Full time studies*

2. Information regarding the discipline

2.1. Name of the discipline	**Internship in Specialization**				*Discipline code*	**MME912**	
2.2. Course coordinator				*Prof. dr. Horia F. Pop*			
2.3. Seminar coordinator				*Prof. dr. Horia F. Pop*			
2.4. Year of study	*2*	*2.5. Semester*	*4*	*2.6. Type of evaluation*	*C*	*2.7. Discipline regime*	*Compulsory*

3. Total estimated time *(hours/semester of didactic activities)*

3.1. Hours per week	**16**	*of which: 3.2 course*	**0**	*3.3 seminar/laboratory/project*	**16**
3.4. Total hours in the curriculum	*192*	*of which: 3.5 course*	*0*	*3.6 seminar/laboratory/project*	**192**
Time allotment for individual study (ID) and self-study activities (SA)					**hours**
Learning using manual, course support, bibliography, course notes (SA)					*76*
Additional documentation (in libraries, on electronic platforms, field documentation)					*76*
Preparation for seminars/labs, homework, papers, portfolios and essays					*60*
Tutorship					*76*
Evaluations					*20*
Other activities					-
3.7. Total individual study hours	**308**				
3.8. Total hours per semester	**500**				
3.9. Number of ECTS credits	**20**				

4. Prerequisites *(if necessary)*

4.1. curriculum	*Computer Science Curriculum*
4.2. competencies	*Theoretical and experimental knowledge in the master specialization* *Knowledge of modelling of relevant applications* *Advanced software development knowledge and skill*

5. Conditions *(if necessary)*

5.1. for the course	
5.2. for the seminar /lab activities	*The hosting institutions should provide at least the following resources:* *• Scientific references for the scientific problem to be investigated* *• Relevant data to help in the validation of any software implementation* *• Fully licensed computer space* *• Fully licensed software development tools*

6.1. Specific competencies acquired [1]

Professional/essential competencies	• *understanding and working with basic concepts in computational intelligence;* • *ability to approach and solve complex problems using various techniques of computational intelligence;*
Transversal competencies	• *capability of information analysis and synthesis;* • *etic and fair behaviour, commitment to professional deontology;*

6.2. Learning outcomes

Knowledge	• *The graduate has the necessary knowledge to devise, model and design of complex software applications in the field of computational intelligence* • *The graduate possesses the fundamental knowledge for modelling, being able to analyse real life problems and to translate them in concrete requirements and to design a corresponding software model*
Skills	• *The graduate can use specific language and terminology for the field of computational intelligence being able to communicate and interact with members of a team* • *The graduate proves the capacity to reflect over own learning resources*
Responsibility and autonomy:	• *The graduate proves knowledge related to specifying the requirements of research activities in the domain of computer science in general and computational intelligence in particular and he/she understands the role of research in promoting progress* • *The graduate knows and respects the ethical and legal principles and rules in scientific research*

7. Objectives of the discipline *(outcome of the acquired competencies)*

7.1 General objective of the discipline	*Gaining abilities to execute a product/program in teams, writing project documentation, under the supervision of a specialized internship tutor and academic staff* *This internship project is associated to the research project: the research project is the scientific and experimental documentation, the internship activity is software development related*
7.2 Specific objective of the discipline	*Execute a product/program in teamwork* *Write necessary documentations* *Public project presentation*

8. Content

8.1 Course	*Teaching methods*	*Remarks*

[1] *One can choose either competences or learning outcomes, or both. If only one option is chosen, the row related to the other option will be deleted, and the kept one will be numbered 6.*

8.2 Seminar / laboratory	*Teaching methods*	*Remarks*
Phase 1. *Establish the problem statement to be solved.* *Study the theoretical implications.*	*Exposure, description, explanation,*	
Phase 2. *Establish the scientific methods and models to pursue* *Scientific investigation on the methods and models and their suitability for the task*	*Dialog lecture, discussions, team debate*	
Phase 3. *Develop detailed specifications of the project* *Project analysis: entities and relations identification, use scenarios, data flow diagrams*	*Dialog lecture, discussions, team debate*	
Phase 4. *Design : conceptual data model, logical data model, computation design, physical data model, user* *interface, application architecture* *Implementation and testing.*	*Questioning, discovery*	
Phase 5. *Integration Testing* *Experiments, data collection, results evaluation*	*Case study, cooperation, questioning*	
Phase 6. *Project presentation and defense*	*Evaluation*	
Bibliography *1. M. Frenţiu, I. Lazăr, Bazele Programării: Proiectarea Algoritmilor, Ed. Univ. Petru Maior, Tg.Mureş, 2000.* *2. M. Frenţiu, I. Lazăr, S. Motogna, V. Prejmerean, Elaborarea algoritmilor, Ed. Presa Universitara, Clujeana, Cluj-Napoca, 1998.* *3. M. Frenţiu, I.A. Rus, Metodologia cercetării ştiinţifice de informatică, Presa universitară clujeană, 2014.* *4. B. Pârv, Analiza si proiectarea sistemelor,Universitatea Babes-Bolyai, Centrul de Formare Continua si Învatamânt la Distanta, Facultatea de Matematica si Informatica, Cluj-Napoca, ed. a III-a, 2003.* *5. L. Ţâmbulea, Baze de date, Litografia UBB Cluj-Napoca 2001.* *6. Electronic resources for the specific investigated research subject*		

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

The course respects the IEEE and ACM Curricula Recommendations for Computer Science studies; *Offers an overall perspective of Computer Science domain, and a general expertise for the student* *Offers basic knowledge about teamwork and integration in a software company*

10. Evaluation

Activity type	*10.1 Evaluation criteria*	*10.2 Evaluation methods*	*10.3 Percentage of final grade*
10.4 Course			
10.5 Seminar/laboratory	*Project evaluation*	*The institution tutor assesses the performance of the interns.*	*80%*
		The faculty mentor assesses the activities (based on the Activity Report).	*20%*
10.6 Minimum standard of performance			
At least grade 5 (from a scale of 1 to 10)			

11. Labels ODD (Sustainable Development Goals)[2]

Not applicable.

Date: *10/4/2025*	*Signature of course coordinator* *Prof. dr. Horia F. Pop*	*Signature of seminar coordinator* *Prof. dr. Horia F. Pop*

Date of approval: *...*	*Signature of the head of department* *Assoc.prof.phd. Adrian STERCA*

[2] *Keep only the labels that, according to the Procedure for applying ODD labels in the academic process, suit the discipline and delete the others, including the general one for Sustainable Development – if not applicable. If no label describes the discipline, delete them all and write „Not applicable.".*