# SYLLABUS

## *Internship in specialization*

## University year 2025-2026

### 1. Information regarding the programme

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

### 2. Information regarding the discipline

| 2.1. Name of the discipline | **Internship in specialization** | | | | | Discipline code | **MME9012** |
|---|---|---|---|---|---|---|---|
| 2.2. Course coordinator | | | | | | | |
| 2.3. Seminar coordinator | | | | **Prof.PhD. Simona Motogna** | | | |
| 2.4. Year of study | 2 | 2.5. Semester | 4 | 2.6. Type of evaluation | C | 2.7. Discipline regime | Mandatory |

### 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 | 4/0/12 |
|---|---|---|---|---|---|
| 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<br>Knowledge of modelling of relevant applications<br> Advanced software development knowledge and skills |

### 5. Conditions (if necessary)

| 5.1. for the course | |
|---|---|
| 5.2. for the seminar /lab activities | The hosting institution should provide at least the following resources:<br>• Scientific references for the scientific problem to be investigated<br>• 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** | <ul><li>analysis, design, and implementation of software systems;</li><li>proficient use of methodologies and tools specific to programming languages and software systems;</li><li>organization of software production processes.</li></ul> |
| **Transversal competencies** | <ul><li>team work capabilities; able to fulfill different roles;</li><li>professional communication skills; concise and precise description, both oral and written, of professional results , negociation abilities;</li><li>entrepreneurial skills; working with economical knowledge; continuous learning;</li></ul> |

## 6.2. Learning outcomes

| | |
|---|---|
| **Knowledge** | - The graduate has the necessary knowledge to devise, model and design of complex software application<br>- The graduate knows the software processes and can integrate them in the organisational culture of a software company |
| **Skills** | - The graduate has the ability to follow the entire life cycle of software system development<br>- The graduate has the ability to communicate and develop relation and partnerships with industrial partners and with all actors involved in the software development process |
| **Responsibility and autonomy:** | - The graduate uses efficient strategies, methods and techniques for lifelong education, in order to self-educate and self-develop his/her personal and professional skills<br>- The graduate has the ability to combine information in different ways in order to form a positive attitude towards his/her own development<br>- The graduate proves advance programming skills which will allow to learn and comprehend modern technologies |

## 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<br>This internship project is associated to the research project:<br>- the research project is the scientific and experimental documentation<br>- the internship report is the software project documentation |
| **7.2 Specific objective of the discipline** | Execute a product/program in teamwork<br>Write necessary documentations<br>Public project presentation |

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[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. Content**

| 8.2 Seminar / laboratory | Teaching methods | Remarks |
|---|---|---|
| Week 1-2.<br>Establish the problem statement to be solved.<br>Study the theoretical implications. | Exposure, description, explanation, | |
| Week 3-4.<br>Establish the scientific methods and models to pursue<br>Scientific investigation on the methods and models and their suitability for the task | discussions, team debate | |
| Week 5-6.<br>Develop detailed specifications of the project<br>Project analysis: entities and relation | discussions, team debate | |
| Week 7-9.<br>Design : conceptual data model, logical data model, computation design, physical data model, user interface, application architecture<br>Implementation and testing. | Questioning, discovery | |
| Week 10-11.<br>Integration Testing<br>Experiments, data collection, results evaluation | Case study, cooperation, questioning | |
| Week 12.<br>Project presentation and defense | Evaluation | |
| Bibliography<br>Bibliography<br>1. M. Frenţiu, I.A. Rus, Metodologia cercetării ştiinţifice de informatică, Presa universitară clujeană, 2014.<br>2. Wohlin, C., & Runeson, P. (2021). Guiding the selection of research methodology in industry–academia collaboration in software engineering. *Information and software technology*, *140*, 106678.<br>3. Digital 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**

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

**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 | | The institution tutor assesses the performance of the interns.<br><br>The faculty mentor assesses the activities (based on Activity Report) | 80%<br><br>20% |
| | | | |
| 10.6 Minimum standard of performance | | | |
| At least grade 5 (from a scale of 1 to 10)<br><br>Basic experience in developing a SE project | | | |

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

*Not applicable.*

| Date: | Signature of course coordinator | Signature of seminar coordinator |
|---|---|---|
| 12.04.2025 | ..................... | Prof.PhD. Simona Motogna |

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

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[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.*".