

# SYLLABUS

## 1. Information regarding the programme

|                                     |  |
|-------------------------------------|--|
| 1.1 Higher education institution    | <b>Babeş Bolyai University</b>                     |
| 1.2 Faculty                         | <b>Faculty of Mathematics and Computer Science</b> |
| 1.3 Department                      | <b>Department of Computer Science</b>              |
| 1.4 Field of study                  | <b>Computer Science</b>                            |
| 1.5 Study cycle                     | <b>Master</b>                                      |
| 1.6 Study programme / Qualification | <b>Applied Computational Intelligence</b>          |

## 2. Information regarding the discipline

|                            |                                     |              |          |                         |          |                        |                   |
|----------------------------|-------------------------------------|--------------|----------|-------------------------|----------|------------------------|-------------------|
| 2.1 Name of the discipline | <b>Internship in Specialization</b> |              |          |                         |          |                        |                   |
| 2.2 Course coordinator     | <b>Prof. Dr. Horia F. Pop</b>       |              |          |                         |          |                        |                   |
| 2.3 Seminar coordinator    | <b>Prof. Dr. Horia F. Pop</b>       |              |          |                         |          |                        |                   |
| 2.4. Year of study         | <b>2</b>                            | 2.5 Semester | <b>4</b> | 2.6. Type of evaluation | <b>C</b> | 2.7 Type of discipline | <b>Compulsory</b> |

## 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 | 16    |
| 3.4 Total hours in the curriculum   | 192 | Of which: 3.5 course | 0 | 3.6 seminar/laboratory | 192   |
| Time allotment:   |     |                      |   |                        | hours |
| Learning using manual, course support, bibliography, course notes                     |     |                      |   |                        | 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 institutions should provide at least the following resources: <ul style="list-style-type: none"> <li>• Scientific references for the scientific problem to be investigated</li> <li>• Relevant data to help in the validation of any software implementation</li> <li>• Fully licensed computer space</li> <li>• Fully licensed software development tools</li> </ul> |

## 6. Specific competencies acquired

|                                  |   |
|----------------------------------|---|
| <b>Professional competencies</b> | <b>C2.1</b> Identification of appropriate methodologies for software development<br><b>C2.3</b> Use of methodologies, specification mechanism and development frameworks for developing software applications<br><b>C2.5</b> Development of dedicated software projects   |
| <b>Transversal competencies</b>  | <b>CT1</b> Apply rules to: organized and efficient work, responsibilities of didactical and scientific activities and creative capitalization of own potential, while respecting principles and rules for professional ethics<br><b>CT2</b> Efficient progress of group activities and development of communications skills and collaboration<br><b>CT3</b> Use efficient methods and techniques for learning, knowledge gaining, and research and develop capabilities for capitalization of knowledge, accommodation to society requirements and communication in English |

## 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: 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<br>Write necessary documentations<br>Public project presentation  |

## 8. Content

| 8.1 Course   | Teaching methods                         | Remarks |
|--|--|---------|
| 8.2 Seminar / laboratory   | Teaching methods                         | Remarks |
| Phase 1.<br>Establish the problem statement to be solved.<br>Study the theoretical implications.   | Exposure, description, explanation,      |         |
| Phase 2.<br>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.<br>Develop detailed specifications of the project<br>Project analysis: entities and relations identification, use scenarios, data flow diagrams                         | Dialog lecture, discussions, team debate |         |
| Phase 4.<br>Design : conceptual data model, logical data model, computation design, physical data model, user interface, application architecture<br>Implementation and testing. | Questioning, discovery                   |         |
| Phase 5.<br>Integration Testing<br>Experiments, data collection, results evaluation  | Case study, cooperation, questioning     |         |
| Phase 6.<br>Project presentation and defense   | Evaluation                               |         |

### Bibliography

1. M. Frențiu, I. Lazăr, Bazele Programării: Proiectarea Algoritmilor, Ed. Univ. Petru Maior, Tg.Mureș, 2000.
2. M. Frențiu, I. Lazăr, S. Motogna, V. Prejmorean, Elaborarea algoritmilor, Ed. Presa Universitara, Clujeana, Cluj-Napoca, 1998.
3. M. Frențiu, I.A. Rus, Metodologia cercetării științifice de informatică, Presa universitară clujeană, 2014.
4. B. Pârv, Analiza si proiectarea sistemelor, Universitatea Babes-Bolyai, Centrul de Formare Continua si Învățământ la Distanță, Facultatea de Matematica si Informatica, Cluj-Napoca, ed. a III-a, 2003.

5. L. Țâmbulea, 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 an general expertise for the student
- Offers basic knowledge about teamwork and integration in a software company

**10. Evaluation**

| Type of activity                             | 10.1 Evaluation criteria | 10.2 Evaluation methods   | 10.3 Share in the grade (%) |
|--|--------------------------|---|-----------------------------|
| 10.4 Course                                  |                          |   |                             |
| 10.5 Seminar/lab activities                  | Project evaluation       | The institution tutor assesses the performance of the interns. The faculty mentor assesses the activities (based on the Activity Report). | 80%<br>20%                  |
| 10.6 Minimum performance standards           |                          |   |                             |
| ➤ At least grade 5 (from a scale of 1 to 10) |                          |   |                             |

Date  
27.04.2023

Signature of course coordinator  
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Signature of seminar coordinator  
Prof. Dr. Horia F. Pop

Date of approval  
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Signature of the head of department  
Prof. Dr. Laura Diosan