

## 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>Artificial Intelligence for Connected Industries</b>

### 2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)	<b>Applications of AI to Cyber-threat Management Aplicații IA în Managementul Amenințărilor Cibernetice</b>						
2.2 Course coordinator	<b>Lect. dr. Grebla Horea</b>						
2.3 Seminar coordinator	<b>Lect. dr. Grebla Horea</b>						
2.4. Year of study	<b>2</b>	2.5 Semester	<b>3</b>	2.6. Type of evaluation	<b>C</b>	2.7 Type of discipline	<b>Optional</b>
2.8 Code of the discipline	<b>MME8240</b>						

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

3.1 Hours per week	2	Of which: 3.2 course	1	3.3 seminar/laboratory	1 pr
3.4 Total hours in the curriculum	28	Of which: 3.5 course	14	3.6 seminar/laboratory	14
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					12
Additional documentation (in libraries, on electronic platforms, field documentation)					12
Preparation for seminars/labs, homework, papers, portfolios and essays					16
Tutorship					5
Evaluations					2
Other activities: .....					-
3.7 Total individual study hours			47		
3.8 Total hours per semester			75		
3.9 Number of ECTS credits			3		

### 4. Prerequisites (if necessary)

4.1. curriculum	<ul style="list-style-type: none"> <li>Master programme AI4CI first semester courses</li> </ul>
4.2. competencies	<ul style="list-style-type: none"> <li>Data communication, Networking, Basic IT security background.</li> </ul>

## 5. Conditions (if necessary)

5.1. for the course	<ul style="list-style-type: none"><li>• Projector</li></ul>
5.2. for the seminar /lab activities	<ul style="list-style-type: none"><li>• Computers</li></ul>

## 6. Specific competencies acquired

<b>Professional competencies</b>	<p>C2.3 Use of methodologies, specification mechanism and development frameworks for developing software applications</p> <p>C2.5 Development of dedicate computer science projects</p> <p>C3.3 Use of mathematical and computer science models and instruments to solve specific problems of application domain</p>
<b>Transversal competencies</b>	<p>CT1. Application of efficient work rules and responsible attitudes towards the scientific domain, for the creative exploitation of one's own potential according to the principles and rules of professional ethics</p> <p>CT2. Efficient conduct of activities organized in an interdisciplinary group and development of empathic capacity of interpersonal communication, networking and collaboration with diverse groups</p> <p>CT3. Use of efficient methods and techniques for learning, information, research and development of abilities for knowledge exploitation, for adapting to the needs of a dynamic society and for communication in a widely used foreign language.</p>

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

7.1 General objective of the discipline	<ul style="list-style-type: none"><li>• The main objective of this course consists in delivering a solid background in cybersecurity and AI applied to cybersecurity and cybercrime.</li></ul>
7.2 Specific objective of the discipline	<ul style="list-style-type: none"><li>• The course will deliver an overview of the cyber-risks and related implications at both technical and operational level. The students will also get some use cases related to the use of AI in the cybersecurity sector and the new trends and techniques used by cyber criminals.</li></ul>

## 8. Content

8.1 Course	Teaching methods	Remarks
<ul style="list-style-type: none"> <li>▪ Understanding security of IT (Informational Technology) and OT (Operational Technology) systems and its impact on industrial operational aspects.</li> <li>▪ Applications in Connected Industries</li> <li>▪ The growing importance of AI and ML in the cybersecurity landscape.</li> </ul>	<ul style="list-style-type: none"> <li>• Interactive exposure</li> <li>• Presentation</li> <li>• Explanation</li> <li>• Practical examples</li> </ul>	
Bibliography Slides will be distributed.		
8.2 Seminar / laboratory	Teaching methods	Remarks
<ul style="list-style-type: none"> <li>▪ Understanding security of IT (Informational Technology) and OT (Operational Technology) systems and its impact on industrial operational aspects.               <ul style="list-style-type: none"> <li>▪ Introduction to IT security and OT security</li> <li>▪ Cybersecurity and cybercrime: the problems, their evolution, their trends</li> <li>▪ The impact of cybercrime</li> </ul> </li> <li>▪ Applications in Connected Industries               <ul style="list-style-type: none"> <li>▪ Industry 4.0 and the digital transformation</li> <li>▪ Supply chain attacks</li> <li>▪ AI as the core of events and traffic analysis, for threat detection and prevention</li> </ul> </li> <li>▪ The growing importance of AI and ML in the cybersecurity landscape.               <ul style="list-style-type: none"> <li>▪ Case Studies and Best Practices</li> <li>▪ Challenges and Opportunities</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Interactive exposure</li> <li>• Explanation</li> <li>• Conversation</li> <li>• Didactical demonstration</li> </ul>	
Bibliography Slides will be distributed.		

## 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 exists in the studying program of all major universities abroad;

**10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	- Understand the main elements of Applications of AI to Cyber-threat Management	Reports on the laboratory/practical exercises	100%
10.5 Seminar/lab activities			
10.6 Minimum performance standards			
Each student should obtain minimum 5 for the final grade.			

Date

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Signature of course coordinator

Lect. dr. Horea Greblă

Signature of seminar coordinator

Lect. dr. Horea Greblă

Date of approval

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Signature of the head of department

Assoc. Prof. dr. Adrian Sterca