## COMPUTATIONAL MODELS FOR EMBEDDED SYSTEMS

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BABEŞ-BOLYAI UNIVERSITY

CLUJ-NAPOCA

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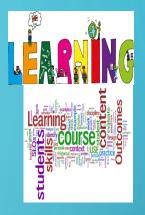




## OUTLINE

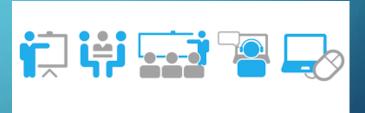
- Class schedule, Grading,
  - What you will learn
  - Class schedule
  - Grading
  - Seminar (Laboratory) activity

### WHAT YOU WILL LEARN



- Model checking
- Synchronous/Asynchronous model of computation
- Finite state machine
- Petri nets
- JSpin
- LabVIEW
- SystemLink
- Research group topic
  - Report + Presentation

skills





## CLASS SCHEDULE (TENTATIVE)

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			Lectures (Tentative)	Laboratories	
1	1	27-1 oct	Introduction	Assignment 1 Model checking (Lab 1 and Lab 2)	
Ç	2	4-8oct	Model checking		
)	3	11-15oct	Synchronous and asynchronous models		
	4	18-22oct	FSM (1)		
	5	25-29 oct	loT + Real Time (NI presentation) (pending dates)	Assignment 2 LabVIEW FSM (Lab 3 and Lab 4)	
	6	1-5nov	FSM (2)		
	7	8-12nov	Automotive (Synopsis presentation)		
)	8	15-19nov	Timed models		
	9	22-26nov	PN	Assignment 3 System Link Internet of Things (Lab 5 and Lab 6)	
)	10	29- <mark>30nov-1dec</mark> -3dec	Hybrid systems		
	11	6-10dec	Dynamical systems		
	12	13-17dec	Security testing		
		20dec-2jan	Holiday	Holiday	
	13	3-7jan	Presentation	Lab 7	
	14	10-14jan	Presentation		

- https://www.cs.ubbcluj.ro/files/curricula/2021/syllabus/IS sem3 MME8026 en avescan 2021 6372.pdf
- https://www.cs.ubbcluj.ro/files/curricula/2021/syllabus/SD\_sem1\_MME8026\_en\_avescan\_2021\_6373.pdf
- Final Grade = 10% Quizzes + 30%\*(A1a+A2a+A3a) + 10%\*Report + 50% Exam (20%Quiz+30%\*(A1b+A2b+A3b)
- Conditions to participate at the final exam
  - There is no restriction regarding the participation at the written examination regarding obtained marks A1a, A2a, A3a, R.
- Ala,A2a,A3a, Report work may not be redone in the retake session.
- Conditions to pass/complete the ATST discipline:
  - $F \ge 5$  final grade.

### Update by next week about the Grading

#### Gamify Your Class

http://www.techedupteacher.com/gamifyyour-class-level-i-xp-grading-system-2/

		Heroic Quests (quizzes) (Bonus)	Side Quests (Lab projects)	Social Quests (Report/Presenta tion)	Epic Quests (Final exam)
	Normal session	300 XP	A1a+A2a+A3a 900 XP	Up to 300 XP	Up to 1400 XP (Quiz 500 + A1b+A2b+A3b 900)
	Retake session	Received during Normal session		Up to 1400XP	

XP intervals	Grade
[1400,1500]	5
[1501,1800]	6
[1801,2100]	7
[2101,2400]	8
[2401,2700]	9
Over 2700	10

Final exam – you must attend (be present) to the final exam in order to compute the grade!

## SOCIAL QUESTS (REPORT/PRESENTATION)

- Conduct a Systematic Literature Review on a provided research topic.
  - Internet of Things
  - Testing Embedded systems
  - Quality attributes of Embedded systems
- References
  - Barbara Kitchenham, Procedures for Performing Systematic Reviews, 2004
  - Barbara Kitchenham, Guidelines for performing Systematic Literature Reviews in Software Engineering, 2007
- Team: 2 persons/team
- Tasks (48h:12=4h/week)
  - 01. Search and save the title (doi) of the articles (minimum 30 articles) (6h)
  - 02. Read abstracts and reduce from 30 to 10 papers (6h). The papers will be provided by the teacher after you send your list.
  - 03. Read each of the 10 papers and produce 1 paragraph/paper (approach, used method, dataset, obtained results) (3h\*10articles=30h).
  - 04. Summarizing table with the 10 articles (6h)
  - 05. Report containing
    - Explain the methodology applied (all the steps and findings regarding various characteristics of the selected articles).
    - ullet The 10 paragraphs and the Summarizing table.
  - 06. Presentation during last 2 lectures (lecture 13/14).

## SIDE QUESTS (LAB PROJECTS)

- Team: 2 students/team
- A1a+A2a+A3a = 900 XP (during Laboratories)
  - Ala Model checking 300
  - A2a FSM 300
  - A3a loT 300
- A1b+A2b+A3b = 900 XP (provided during Laboratories, part of the Final Exam)
  - A1b Model checking 300
  - A2b -FSM 300
  - A3b loT 300

# © EPIC QUESTS (FINAL EXAM)

- Up to 1400 XP
  - 900 XP A1b+A2b+A3b = 900 XP (provided during Laboratories, part of the Final Exam)
  - 500 XP Quiz

## BONUS

- Education Research Study (ELEVATOR grant)
  - 300 XP
  - Each student individually
  - Answering to ALL questionnaires ( 3 to 5 to be designed)
  - No right/wrong answers.
- EOX-XR prepare a lesson on a concept
  - 300XP
  - pending (need to talk about accounts)
  - 2 students
- Research activity (30h:12=2,5 h/week)
  - 600 XP
  - 2 students + teacher
  - Next "step" of the Report
  - Design (6h)
  - Implementation +1 experiment (24h)
  - Paper to be submitted to a Journal/Conference
  - 3 team maximum allowed (first 3 announced until 14 October)

- Research report
  - 300 XP
  - Pecha Kucha presentation of the prepared report

(3 minutes video)

3 Evaluations of your peers

#### Research

- Dissertation Thesis
- Internship in Specialization

#### **Publications with students**

- EMSE 2019/2020
- Studia Informatica
  - EASE 2021
- EMSE 2020/2021(?),

#### **GRADING**

- Your input about grading
- Mentimeter
  - menti.com
  - Use code: 12973934

Update by next week about the Grading