

COMPUTATIONAL MODELS FOR EMBEDDED SYSTEMS

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CLUJ-NAPOCA

2021-2022





OUTLINE

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

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

GRADING

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% Exem (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.
 - A1a,A2a,A3a, Report work may not be redone in the retake session.
 - Conditions to pass/complete the ATST discipline:
 - $F \geq 5$ final grade.

• **Update by next week about the Grading**

Gamify Your Class

<http://www.techedupteacher.com/gamify-your-class-level-i-xp-grading-system-2/>

	Heroic Quests (quizzes) (Bonus)	Side Quests (Lab projects)	Social Quests (Report/Presentation)	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).
 - 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)
 - $A1a$ – Model checking - 300
 - $A2a$ – FSM - 300
 - $A3a$ – IoT - 300
- $A1b + A2b + A3b = 900$ XP (provided during Laboratories, part of the Final Exam)
 - $A1b$ – Model checking - 300
 - $A2b$ – FSM - 300
 - $A3b$ – IoT - 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](https://www.menti.com)
 - Use code: 12973934
- Update by next week about the Grading