

SYLLABUS  
for the discipline:

“ADVANCED EMBEDDED SYSTEMS”

FACULTY \_\_ OF AUTOMATION AND COMPUTERS \_\_  
DOMAIN /SPECIALIZATION \_\_ COMPUTER SYSTEM ENGINEERING \_\_

Year of studies: \_\_\_\_ I MASTER \_\_\_\_

Semester: 2

Course instructor: *Prof. dr. ing. Mircea POPA*  
Applications instructor:

**Number of hours/week/Evaluation/Credits**

Course	Seminar	Laboratory	Project	Evaluation	Credits
2	0	0	1	E	9

**A. COURSE OBJECTIFS**

- to understand the design goals and methodologies for high performance embedded computing;
- to learn the main and specific topics for high performance embedded systems;
- to understand the modeling process for embedded systems;
- to obtain a consistent overview of the specific problems of the embedded systems;
- to be able to outline the adequate embedded system architecture for a type of applications.

**B. COURSE SUBJECTS**

**Introduction:** General features, Design goals and methodologies, Specifications, Reliability, safety and security;  
**Embedded systems hardware:** Inputs/ outputs, CPU, Memories, Interrupts; **Embedded systems software:** Operating systems, Real time process scheduling, Programs; **Multiprocessors in embedded systems; Hardware/ software codesign; Validation of embedded systems;**

**C. APPLICATIONS SUBJECTS (laboratory; seminar; project)**

**Projects:**

1. Modeling embedded systems
2. The GNU operating systems
3. Operating systems for embedded systems
4. Programming languages for embedded systems
5. System-on-chip's (SoC's)
6. Network-on-chip's (NoC's)
7. Debugging embedded systems
8. Solutions for minimizing the consumption in embedded systems

**D. REFERENCES**

1. P. Marwedel: *Embedded System Design*, Springer, 2006
2. W. Wolf: *High-Performance Embedded Computing*, Elsevier, 2006
3. R. Zurawski: *Embedded Systems Handbook (Industrial Technology)*, CRC, 2005

**E. EVALUATION PROCEDURE**

Exam and project each of them with 50% of the final note.

**F. INTERNATIONAL COMPATIBILITY**

1. University of Dortmund: *Embedded Systems*
2. University of Essex: *Advanced Embedded System Design*
3. University of Utah School of Computing: *Advanced Embedded Systems*

Date: 10.04.2008

**HEAD OF DEPARTMENT**

**Prof. dr. ing. Vladimir CREȚU**

**COURSE INSTRUCTOR;**

**Prof. dr. ing. Mircea POPA**