EE-530 **Test of VLSI systems**

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Cursus	Sem.	Type
Electrical and Electronical Engineering	MA1, MA3	Opt.
MNIS	MA3	Obl.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	Written
Workload	60h
Weeks	14
Hours	**2 weekly**
Lecture	2 weekly
Number of positions	

Summary

Test of VLSI Systems covers theoretical knowledge related to the major algorithms used in VLSI test, and design for test techniques. Basic knowledge related to computer-aided design for test techniques, and their integration into a design-flow are presented.

Content

This course covers the analysis and implementation of test techniques for digital VLSI. Regular class lectures form the core of the course.Introduction to test theoryIntroductory topics cover the role of testing, automatic test equipment and an overview of the economics of test.Test methodsIn a second part, fault modeling and test methods are studied. The major topics that will be considered are related to fault simulation, automatic test-pattern generation (significant combinational and sequential ATPG algorithms), measures of testability and miscellaneous test methods. Industry popular models and algorithms are presented and exercised. Design for testabilityA third part sets the focus on design for test (DFT) techniques. Tackled topics include scan design, built-in-self-testing (BIST - LFSR and signatures) and the Boundary-Scan standard (JTAG). Testing of memory circuits is also presented.
Aside from theoretical lectures, a number of course modules are devoted to in-class guided exercise sessions, and hand-on computer laboratory sessions, which take place along the semester and complement with a practical-oriented presentation of the topics.

Keywords

VLSI systems test, integrated circuits test, D-algorithm, design for test

Learning Prerequisites

Recommended courses

Basics of VLSI, digital systems

Learning Outcomes

By the end of the course, the student must be able to:

- Elaborate an integrated circuit test strategy
- Analyze the needs in test of a VLSI system
- Develop blocs enabling integrated circuit test
- Assess / Evaluate necessity to carry out test

Transversal skills

- Communicate effectively with professionals from other disciplines.
- Use both general and domain specific IT resources and tools

Teaching methods

Ex cathedra class lectures, exercises and practical exercises

Expected student activities

Attend class lectures, solve exercises, attend and solve practical laboratory exercises using professional software

Assessment methods

Written, with a mandatory continuous control written midterm and laboratory sessions

Supervision

Office hours	No
Assistants	Yes
Forum	No

Resources

Ressources en bibliothèque

- Essentials of Electronic Testing / Bushnell

Notes/Handbook

Lecture notes
M. Bushnell, V. D. Agrawal, Essentials of Electronic Testing, Springer, 2000

Moodle Link

- https://go.epfl.ch/EE-530

Prerequisite for

Projects