Reliability and Quality in Nanoelectronics

Subject area: Computer Science/ICT

University:	TalTech
Level:	MA all years, PhD
Teaching mode:	hybrid: some students participate online, other students attend real-life
Instructor(s):	Maksim Jenihhin

Short description

The course covers essential topics of reliability and quality in nanoelectronics from transistors to chips. It is designed for future computing systems engineers and researchers specializing in a wide range of hardware, software, IoT, cyber-physical robotics, cyber-security and electronics disciplines. In the nanoelectronics era, the details of the hardware failure mechanisms are vital to master dependability of the target system through its entire lifespan.

Full description

https://ois2.ttu.ee/uusois/subject/IAS0350

Learning outcomes

At the end of the course, the learner will be able to:
- analyze the essentials of quality in nanoelectronics, design and manufacturing defects, approaches for their modelling, testing and diagnosis.
- analyze the essentials of reliability in nanoelectronics, including the main failure mechanisms during the nanoelectronic system's lifespan, approaches for their modelling, assessment and mitigation.
- analyze the impact and tradeoffs of reliability and quality in system's hardware on the overall cost-energy-performance efficiency and dependability of the target system.

General information

Contact hours per week:	3
Total workload:	156 (in student hours for the whole course)
ECTS credits:	6
Language:	English

Course start date:	07 September 2022
Course end date:	14 December 2022
Add. info about start date:	
Weekly teaching day/time:	
Time zone:	CET +1 (Estonia, Israel)
Further information:	
Prerequisites:	General computer engineering and computer architecture knowledge.
Activities and methods:	Lectures, Seminars, Group work, Lab-work, Self-study, Exercises, Tutorial sessions
Presence on campus:	not required

Final examination

Form:	oral
Date:	
Location/format:	online
Re-sit possibility:	yes
Transcript available:	end of semester
Add. info/requirements:	The final result takes into account the results for hands-on labs and an interactive seminar.

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places:	10
Minimum participants:	
Internal course code:	IAS0350
Contact:	maksim.jenihhin@taltech.ee

EuroTeQ Engineering University

This course is part of the EuroTeQ Engineering University joint course catalogue 2022/2023. This is a collaborative activity of the partner universities DTU, L'X, TU/e, TalTech, CTU, TUM as well as Technion. Students from these universities can participate in the offered courses. It is the responsibility of the student to check if you fulfil the requirements to participate in a specific course. Students are also advised to check with their home institution how to get recognition of the ECTS credits gained in courses of the EuroTeQ course catalogue. For further information about EuroTeQ Engineering University, visit www.euroteq.eu or get in touch with the above-mentioned point of contact.