

STIMESI MEMS Training Course Program

Tronics MEMS SOI H.A.R.M Process

CTU, Czech Technical University

Prague, Czech Republic

November 10 – 12, 2009

Following this training course, STIMESI will hold their annual Workshop on 13 November. This year the Workshop will be held at the Kaiserstejnsky Palace in Prague.

If you wish to attend both the training course and the Workshop, please book your place on both events separately.

Abstract

This three day training course provides instruction in the design of electrostatic and capacitive sensors and actuators for fabrication using the multi-project wafer (MPW) processes of Tronics Microsystems.

Tronics Microsystems fabrication process utilises surface micromachining of an epitaxial Silicon-on-Insulator substrate. Through this approach, designers may exploit the excellent mechanical properties of the process' 20 µm thick silicon layer to construct highly sensitive capacitive transducers, electrostatic actuators, and resonators.

Previously fabricated microsystems which are representative of the capabilities of this process include:, microfluidic flow sensors, accelerometers, and force sensors.

Target Groups

The course is primarily aimed at postgraduate students and researchers from European universities and research institutes with interest in developing MEMS design skills and accessing low-cost fabrication services who may participate free of charge. In addition, engineers and researchers from industry and other organisations are invited to participate for a minimal fee.

No prior knowledge of MEMS design and processing is required.

Objectives

- Provide awareness of common sensor transduction methods;
- Introduce Tronics' SOI-HARM MPW processes and the key concepts of high aspect ratio micromachining of silicon;
- Explain methods to help participants design and analyse devices manufactured in the Tronics' MPW processes;
- Explain Tronics' SOI-HARM MPW process flows and design rules to enable students to design with confidence;
- Provide familiarity with CoventorWare for MEMS design and layout with supporting SOI-HARM-specific modules;
- Give details about Tronics' MPW access through Europractice, explain submission procedure and Europractice support
- Reinforce learning through practical case studies and worked examples based on simple devices during and after the course;
- Support participants to develop their own design ideas

Topics

Day 1

Tutorial, morning, on "Sensing Principles and MEMS Technologies". The attendees who are beginners in the MEMS field can start with this tutorial.

The afternoon of the first day of this training course will be reserved for presenting the Tronics' MPW processes, covering in detail Tronics' high aspect ratio micromachining (HARM) of silicon.

The session will follow the following format:

- Introduction to the multi-project wafer services;
- Features and limitations of the presented processes;
- Outline of the conventions and design rules;
- Overview of the recommended design flow.

Day 2

The focus of the second day of the course will be on practical hands-on training in the design procedure for the covered process. Initially, a description of the structure and contents of the foundry design kits will be given. Instruction in the use of appropriate design tools will follow. CAD tools employed in the course will include L-Edit and CoventorWare. The afternoon session shall consist of an introduction to the hands-on design tutorial, targeting a design for the Tronics' process. EUROPRACTICE MPW offer and design flow procedure will be presented, as well as extra improved design kits and eventually co-design with IC.

Day 3

The third day will be dedicated to design & layout and basic FEM simulation (if available) of an accelerometer available on the Tronics MPW process. Alternatively, in the afternoon participants may take the opportunity to work on own designs, and discuss the available options with the present foundry representatives.

What is STIMESI?

The goal of the STIMESI Stimulation Action is to stimulate European universities and research institutes to adopt MEMS and SiP technologies. The more experienced universities already active in MEMS design / technology will be assisted to increase their MEMS research activities and to design and fabricate more MEMS circuits and SiP components. Additionally other universities not currently active in this area will be given guidance to help them bootstrap their MEMS / SiP teaching and research activities.

Who should attend?

All EUROPRACTICE member universities and research institutes that want to begin or strengthen their teaching and/or research activities in MEMS / SiP technologies. Also companies having interest in using MEMS in future products are invited to attend.

Location

The course will be held at the Department of Microelectronics, Faculty of Electrical Engineering of the Czech Technical University in Prague.

The Czech Technical University in Prague was founded in 1707 by the King of Bohemia and Holy Roman Emperor Joseph I. The University has a long tradition of cutting edge science and engineering together with high-quality technical education. The University is located in and around the centre of the picturesque city of Prague. It has expanded in recent years, and runs four additional campuses outside Prague. Currently, approximately 23,000 students are enrolled at eight faculties and three research institutes, covering a total of 7 bachelor programs, 17 master programs and 12 PhD programs.

The Department of Microelectronics was established in January 1977. Since then, more than 1000 students have graduated in the branch of Microelectronics. Ph.D. or D.Sc. degrees have been also awarded. The Department maintains international co-operation with universities in the EC and has links and co-operative projects with many electronic institutions.

Following the Tronics training course at the Czech Technical University in Prague, STIMESI will hold their annual Workshop (13 November). This year the Workshop will be held at the Kaiserstejnsky Palace in Prague. If you wish to attend both the training course and the Workshop, please book your place on both events separately.

Address:

Department of Microelectronics
Faculty of Electrical Engineering
Czech Technical University in Prague
Technicka 2
Prague
Czech Republic

Useful links:

University website: <http://www.cvut.cz/en>
Department of Microelectronics: <http://www.micro.feld.cvut.cz/eng>
CTU Location : http://www.stimesi.rl.ac.uk/locations/CTU_location.pdf

Start /end date: November 10 – 12, 2009

Accommodation

Participants need to make their own accommodation and travel arrangements.

Useful links:

Local hotels: Prague Tourist Board : <http://www.prague-info.cz/>

Fees

- Attendance is free for members of universities and research centers from all 27 EU countries and Norway, Iceland, Lichtenstein, Israel, Croatia, Switzerland and Turkey. In case the course is oversubscribed, access may be limited to one participant per institute and will be on a first-come basis;
- Companies and other organisations: 300 € (excl. 21% VAT);
- Fee includes all lectures, course materials, lunches and refreshment breaks. Accommodation, transport and other meals are not included in the course fee;
- Cancellation by a participant between 2 and 28 days before the start of the course is subject to a 200 € administration fee. A 300 € fee will be charged for cancellation within 48 hours of the start of the course or for those who do not attend.

More information

For more information, please visit the following links:

www.stimesi.org

www.europactice.com

www.multimems.com

www.tronics.eu

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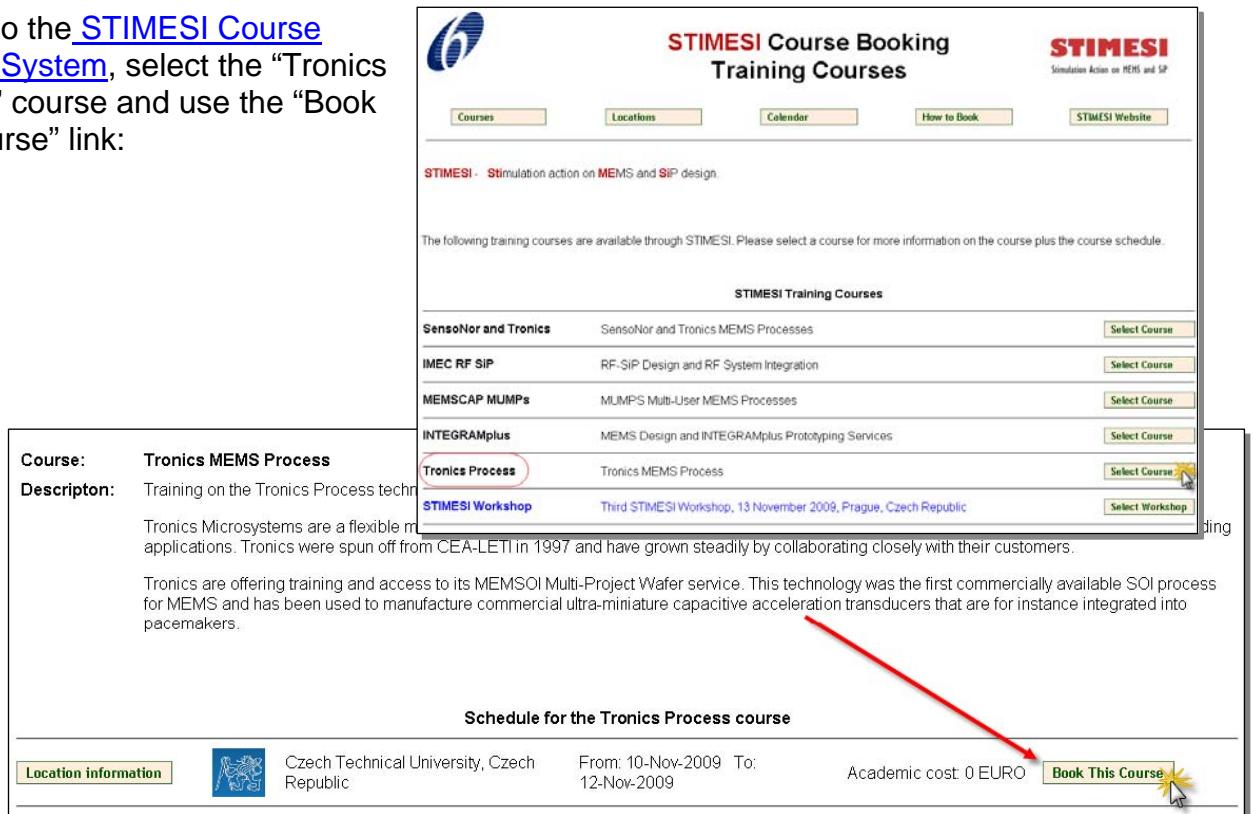
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REGISTRATION

Registration can be done using the STIMESI Course Booking System, which is managed and maintained by STFC Rutherford Appleton Laboratory, UK.

The following link brings you there : <http://www.stimesi.rl.ac.uk>

Browse to the [STIMESI Course Booking System](#), select the “Tronics Process” course and use the “Book This Course” link:



The screenshot shows the STIMESI Course Booking System interface. At the top, there are navigation tabs for Courses, Locations, Calendar, How to Book, and STIMESI Website. Below the navigation, a table lists various training courses. The 'Tronics Process' course is highlighted with a red circle, and its 'Select Course' button is also highlighted. A red arrow points from the 'Book This Course' button in the course details section to the 'Book This Course' button in the table.

STIMESI Training Courses		
SensoNor and Tronics	SensoNor and Tronics MEMS Processes	Select Course
IMEC RF SiP	RF-SiP Design and RF System Integration	Select Course
MEMSCAP MUMPS	MUMPS Multi-User MEMS Processes	Select Course
INTEGRAMplus	MEMS Design and INTEGRAMplus Prototyping Services	Select Course
Tronics Process	Tronics MEMS Process	Select Course
STIMESI Workshop	Third STIMESI Workshop, 13 November 2009, Prague, Czech Republic	Select Workshop

Course: Tronics MEMS Process
Description: Training on the Tronics Process technology. Tronics Microsystems are a flexible manufacturing technology for MEMS applications. Tronics were spun off from CEA-LETI in 1997 and have grown steadily by collaborating closely with their customers. Tronics are offering training and access to its MEMSOI Multi-Project Wafer service. This technology was the first commercially available SOI process for MEMS and has been used to manufacture commercial ultra-miniature capacitive acceleration transducers that are for instance integrated into pacemakers.

Schedule for the Tronics Process course

Location information: Czech Technical University, Czech Republic
 From: 10-Nov-2009 To: 12-Nov-2009
 Academic cost: 0 EURO
[Book This Course](#)

NOTES:

This course is limited to **30** participants to ensure a high quality of training. Please reserve your place early. This course runs approximately every 6 months and moves to different locations within Europe.

A joining pack will be sent to registrants containing details of the course location, schedule and suggested local accommodation.

The STIMESI Course Booking System is managed and maintained by STFC Rutherford Appleton Laboratory. All enquires should be emailed to: stimesi@rl.ac.uk