

“INTERNATIONAL WORKSHOP ON CLEANROOM TRAINING FOR CRITICAL & SUSTAINABLE TECHNOLOGIES”

LAB-ON-A-CHIP (LoC)

Bilkent University – UNAM, Ankara / TURKEY

(25 June – 8 July 2012)

First Week: Lectures and seminars on cleanroom-based micro/nano-fabrication and LoC technology

Venue: Faculty of Fine Arts Building

Date	Hours	Lectures/Events	Speakers/Lecturers
25 June Monday	08.30-09.30	Registration	
	09.30-10.45	Welcome and opening remarks	<i>UNAM, Bilkent University, MoSIT, TIKA, SESRIC, UNIDO</i>
	10.45-11.30	Opening Reception	
	11.30-12.30	<u>Keynote Talk</u> : “Microsystems Engineering for a Greener World”	Amit LAL , <i>Cornell University</i>
	12.30-13.30	Lunch	
	14.00-15.00	“Opportunities of UNAM Cleanroom Facility (UCF)” + “Introduction to micro/nano-fabrication processes”	Necmi BIYIKLI , <i>UNAM</i>
	15.00-15.30	Coffee/tea break	
	15.30-17.30	UNAM tour	UNAM & UCF Staff
	18.00-19.00	Dinner	
	20.00-21.30	Country presentations – 1	
26 June Tuesday	09.00-10.00	“Lithography techniques, equipments & theory”	Necmi BIYIKLI , <i>UNAM</i>
	10.00-11.00	“Advanced lithography techniques”	Aykutlu DANA , <i>UNAM</i>
	11.00-11.30	Coffee/tea break	
	11.30-12.30	“Thin film deposition techniques, equipment & theory”	Ali Kemal OKYAY , <i>Bilkent University</i>
	12.30-13.30	Lunch	
	14.00-15.00	“Etching techniques (dry/wet), equipment & theory”	Necmi BIYIKLI , <i>UNAM</i>
	15.00-16.00	“Characterization (surface, optical, structural, electrical) techniques, equipments and theory”	Aykutlu DANA , <i>UNAM</i>
	16.00-16.30	Coffee/tea break	
	16.30-17.30	“Process and Equipment Control in High Volume Micro/Nano-Fabrication”	Necmi BILIR , <i>Semiconductor Specialist</i>
	18.00-19.00	Dinner	
	20.00-21.30	Country presentations – 2	

Date	Hours	Lectures/Events	Speakers/Lecturers
27 June Wednesday	09.00-10.00	“Functional optical metamaterials and nanophotonic devices for sensing and energy applications”	Koray AYDIN , <i>Northwestern University</i>
	10.00-11.00	“Micro and nano-particle trapping and manipulation with fluid flow”	Melikhan TANYERI , <i>University Of Illinois at Urbana Champaign</i>
	11.00-11.30	Coffee/tea break	
	11.30-12.30	“Integration of thin film sensors and devices”	Ali Kemal OKYAY , <i>Bilkent University</i>
	12.30-13.30	Lunch	
	14.00-15.00	“Capacitive micromachined ultrasonic transducers for medical applications”	Ömer ORALKAN , <i>North Carolina State University (NCU)</i>
	15.00-16.00	“Advanced plasmonics for single molecule detection and chemically-specific real-time imaging”	Aykutlu DANA , <i>UNAM</i>
	16.00-16.30	Coffee/tea break	
	16.30-17.30	“Morbidostat: a novel fluidic apparatus for studying bacterial drug resistance”	Erdal TOPRAK , <i>Sabancı University</i>
	18.00-19.00	Dinner	
20.00-21.30	Country presentations – 3		
28 June Thursday	09.00-10.00	“Dissecting the gene regulatory networks governing muscle cell differentiation: Combining DNA microarray chips with molecular genetic studies”	Ertuğrul ÖZBUDAK , <i>Albert Einstein College of Medicine</i>
	10.00-11.00	“Nanostructured sensors: Optoelectronic nose and large-area nanowire circuitry”	Mehmet BAYINDIR , <i>Bilkent University</i>
	11.00-11.30	Coffee/tea break	
	11.30-12.30	“BioMEMS and microfluidic devices for Lab-on-a-Chip (LOC) Applications”	Haluk KULAH , <i>Middle East Technical University (METU)</i>
	12.30-13.30	Lunch	
	14.00-15.00	“Microtechnologies to assemble functional 3D tissue models In Vitro”	Utkan DEMIRCI , <i>Harvard-MIT/Health Sciences and Technology</i>
	15.00-16.00	“Two new methods for obtaining optofluidic waveguides using aerogels and laser ablation”	Alper KIRAZ , <i>Koç University</i>
	16.00-16.30	Coffee/tea break	
	16.30-17.30	“An Engineering Approach to Biology: Problems, Methods, and Tools”	Savaş TAY , <i>Swiss Federal Institute of Technology, ETH Zurich</i>
	18.00-19.00	Dinner	
20.00-21.30	Country presentations – 4		

Date	Hours	Lectures/Events	Speakers/Lecturers
29 June Friday	09.00-10.00 10.00-11.00 11.00-11.30 11.30-12.30 12.30-13.30 14.00-15.00 15.00-16.00 16.00-16.30 16.30-17.30 18.00-19.00 20.00-21.30	<p>“Nanomechanical technologies for biomedicine, energy, and environment”</p> <p>“Focused Ion Beam (FIB) Milling: A diverse tool for nanostructuring and its applications in nanophotonics”</p> <p>Coffee/tea break</p> <p>“The Mechanism of Cytoplasmic Dynein Motility”</p> <p>Lunch</p> <p>“Robust biosensing based on diffractometry”</p> <p>“Lab on a chip devices: from prototype to the market”</p> <p>Coffee/tea break</p> <p>“3D nanostructures fabricated by glancing angle deposition (GLAD)”</p> <p>Dinner</p> <p>Country presentations – 5</p>	<p>Özgür ŞAHİN, <i>Columbia University</i></p> <p>Feridun AY, <i>Anadolu University</i></p> <p>Ahmet YILDIZ, <i>University of California – Berkeley</i></p> <p>Çağrı SAVRAN, <i>Purdue University</i></p> <p>Çağlar ELBUKEN, <i>Koç University</i></p> <p>Tansel KARABACAK, <i>University of Arkansas at Little Rock</i></p>
30 June Saturday	06.30-02.00	<p>Istanbul excursion & Technical cleanroom facility visit</p> <ul style="list-style-type: none"> • Open-buffet breakfast on the mountains – Bolu/Gerede • Sabancı University Nanotechnology Research & Application Center (SUNUM) visit • Lunch @ Sultan Ahmet Köftecisi • Museums & Historical Sites: Blue Mosque, Hagia Sophia, Topkapi Palace, Grand Bazaar • Dinner on cruise & Bosphorous tour 	<p>Volkan OZGUZ, <i>Sabancı University</i></p>
1 July Sunday	18.00-21.00 21.45-23.30	<p>Time for rest and football!</p> <p>International workshop football tournament</p> <p>EURO-2012 Final game</p>	

Second Week: Hands-on laboratory practice in UNAM Cleanroom Facility

Venue: UNAM Building & Science Faculty Building SA-240 Seminar Room

Date	Hours	Group 1	Group 2	Group 3	Group 4
2 July Monday	09.00-10.30	Cleanroom safety training & orientation	Cleanroom safety training & orientation	FEI Workshop: Presentations	FEI Workshop Presentations
	10.30-11.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	11.00-12.30	Microfluidic device fabrication overview & video showing	Microfluidic device fabrication overview & video showing	FEI Workshop: Tool demonstrations	FEI Workshop: Tool demonstrations
	12.30-13.30	Lunch	Lunch	Lunch	Lunch
	14.00-15.30	FEI Workshop: Presentations	FEI Workshop: Presentations	Cleanroom safety training & orientation	Cleanroom safety training & orientation
	15.30-16.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	16.00-17.30	FEI Workshop: Tool demonstrations	FEI Workshop: Tool demonstrations	Microfluidic device fabrication overview & video showing	Microfluidic device fabrication overview & video showing
		18.00-19.00 20.00-21.30	Dinner Country presentations – 6		
		Group 1	Group 2	Group 3	Group 4
3 July Tuesday	09.00-10.30	Photomask generation + Photolithography + Surface profiler	Si dry-etch using ICP + photoresist stripping	Centrotherm + Air Products Workshop: Presentations	Centrotherm + Air Products Workshop: Presentations
	10.30-11.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	11.00-12.30	Si dry-etch using ICP + photoresist stripping	Photomask generation + Photolithography + Surface profiler	Centrotherm + Air Products Workshop: Tool demonstrations	Centrotherm + Air Products Workshop: Tool demonstrations
	12.30-13.30	Lunch	Lunch	Lunch	Lunch
	14.00-15.30	Centrotherm + Air Products Workshop: Presentations	Centrotherm + Air Products Workshop: Presentations	Photomask generation + Photolithography + Surface profiler	Si dry-etch using ICP + photoresist stripping
	15.30-16.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	16.00-17.30	Centrotherm + Air Products Workshop: Tool demonstrations	Centrotherm + Air Products Workshop: Tool demonstrations	Si dry-etch using ICP + photoresist stripping	Photomask generation + Photolithography + Surface profiler
		18.00-19.00 20.00-21.30	Dinner Country presentations – 7		

Date	Hours	Group 1	Group 2	Group 3	Group 4
4 July Wednesday	09.00-10.30	PDMS coating + Curing process	SEM etch analysis + 3D optical profiler	ThermoFisher workshop - theory	ThermoFisher workshop - theory
	10.30-11.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	11.00-12.30	SEM etch analysis + 3D optical profiler	PDMS coating + Curing process	ThermoFisher workshop – demo	ThermoFisher workshop – demo
	12.30-13.30	Lunch	Lunch	Lunch	Lunch
	14.00-15.30	ThermoFisher workshop - theory	ThermoFisher workshop - theory	PDMS coating + Curing process	SEM etch analysis + 3D optical profiler
	15.30-16.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	16.00-17.30	ThermoFisher workshop – demo	ThermoFisher workshop – demo	SEM etch analysis + 3D optical profiler	PDMS coating + Curing process
	18.00-19.00	Dinner			
	20.00-21.30	Country presentations – 8			
		Group 1	Group 2	Group 3	Group 4
5 July Thursday	09.00-10.30	Plasma treatment and bonding of PDMS + glass substrate	Electrode metal deposition + patterning	EVG Workshop – presentation	EVG Workshop – presentation
	10.30-11.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	11.00-12.30	Electrode metal deposition + patterning	Plasma treatment and bonding of PDMS + glass substrate	EVG Workshop – tool demonstration	EVG Workshop – tool demonstration
	12.30-13.30	Lunch	Lunch	Lunch	Lunch
	14.00-15.30	EVG Workshop – presentation	EVG Workshop – presentation	Plasma treatment and bonding of PDMS + glass substrate	Electrode metal deposition + patterning
	15.30-16.00	Coffee/tea break	Coffee/tea break	Coffee/tea break	Coffee/tea break
	16.00-17.30	EVG Workshop – tool demonstration	EVG Workshop – tool demonstration	Electrode metal deposition + patterning	Plasma treatment and bonding of PDMS + glass substrate
	18.00-19.00	Dinner			
	20.00-21.30	Country presentations – 9			

Date	Hours	Lectures/Event	Speaker/Lecturer
6 July Friday	09.30-10.30 10.00-10.30 10.30-12.00 12.30-13.30 14.00-15.00 18.00-21.00	Plenary Talk: “Infectious disease detection, using lab on chip and related technologies” Coffee/tea break Closing remarks & Certification ceremony Lunch UNIDO evaluation Closing dinner (UNAM lecturers & staff, participants, MoSIT, TIKA, and UNIDO)	Andreas Manz, KIST-Europe <i>MoSIT, UNIDO, TIKA, SESRIC, UNAM</i>
7 July Saturday	10.00-16.00	Ankara tour	
8 July Sunday		End of program	